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# SOIL CONSERVATION

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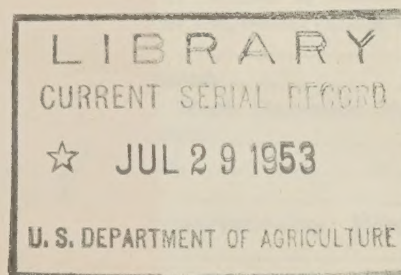


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SECRETARY OF AGRICULTURE

**HUGH H. BENNETT**  
CHIEF, SOIL CONSERVATION SERVICE

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## WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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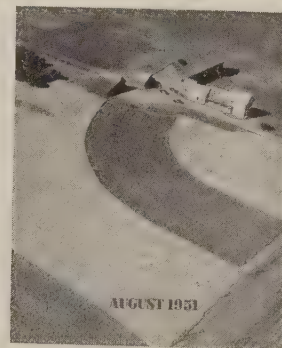
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**PASTURE FOR PIGEONS.**—The Floyd County (Ind.) Soil Conservation District recently received a request from J. Wagoner Wayne of New Albany for help with a soil conservation plan to provide improved pasture and more wrinkled peas for a flock of 300 pigeons.

**WIDENING THE CIRCLE.**—Does group action pay? "Yes," answer District Conservationist Bud Gilbert, of Coeur D'Alene, Idaho, and Mel Carlson of his staff.

When Carlson started work about 5 years ago he began keeping record of the farmers he talked to and what he talked to them about. By early February this year Mel changed over to this new-fangled group-action approach. By late April he noticed that his record of farmer contacts had grown at an almost unbelievable rate. Out of curiosity, he and Gilbert sat down and went over the record. They discovered that in the 3 months Mel had seen more new farmers, and talked to more of them about conservation, than he had in the previous 5 years.



**FRONT COVER.**—This photograph by Gordon S. Smith shows some of the Ralph McAttee farm, located near Hodgdon, Maine. McAttee has been working in his soil conservation district since 1949. This picture, made in August last year, shows potatoes in dark strips, oats in light strips.

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# LET'S TAKE A LOOK AT THE SOUTHERN HIGH PLAINS

By H. H. FINNELL

*Editor's Note.—Mr. Finnell is widely regarded as the world's greatest authority on wind erosion and its control. A research specialist with the Soil Conservation Service, he makes his headquarters at the Panhandle A. & M. College, Goodwell, Okla. This article was suggested by a talk which Mr. Finnell made recently at a staff conference of the Secretary of Agriculture.*

CONDITIONS in parts of the Southern High Plains are now beginning to make us ponder our errors of the past.

Southwest of Lubbock, Tex., we have a little Dust Bowl just old enough to pay half fare. In the arid margins of the wheat belt we are experiencing the first serious wind-erosion hazard since some of that land was plowed.

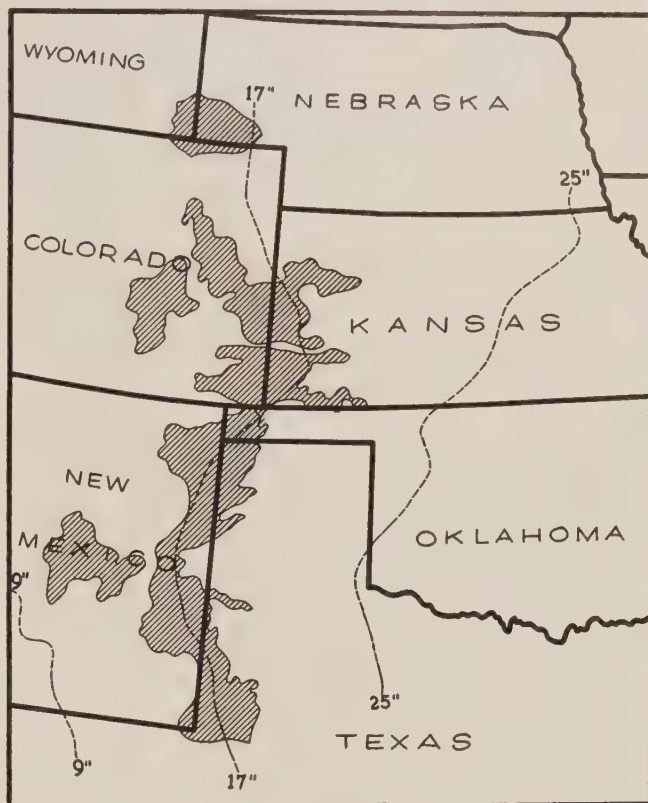
Both trouble spots are the direct result of breaking out low-capability lands. In the marginal Lubbock cotton area the soils are too sandy; in the marginal wheat area they are too shallow to stand the pressure of cultivation. Dust storms of the current season have come from both directions across the Panhandle of Oklahoma, where my headquarters is located.

According to experience, these soils are destined for early abandonment. Enforced abandonment in the past has been very wasteful. Voluntary retirement to grass is preferable as to long-time economy of soil resources.

The prospects of dust from the marginal wheat area next year are increasing. A near crop failure there last year is being succeeded by a complete failure this year. Land thus deprived of two crops' residues is certain to blow persistently unless remedied by an immediate—1951—change from wheat to sorghums. Summer fallowing under present conditions only makes the blowing worse, and cannot assure a wheat crop.

The hazardous areas are parts of the marginal zone shown on the accompanying map.

This zone is not 100 percent marginal but consists of areas where marginal lands predominate.



It has become an orphan. Semiarid dry-land farmers will not claim it because of its bad behavior. Ranchmen of the arid ranges cannot claim it because it is overpriced.

It has been neglected by research agencies, mostly, I think, because it has not been recognized as a separate problem area. It needs more serious studies of land-capability and land-use experience, principally outside of the old Dust Bowl area.

The popular attitude toward most agricultural problems in the plains seems to me to be healthy. It is open-minded on the unanswered questions. Particularly well have farmers accepted the proved wind-erosion control practices. They are alert to seasonal hazards, and those who are farming high-capability lands are in a good position to weather severe drought. There does exist, however, a general lack of understanding about good and poor land.

Too many people think if land is plowable it must surely be suitable for cultivation.

I was reckless enough last week to appear before a meeting of the American Association of Agricultural Editors. One editor asked me the \$64 question: "After meeting all the spectacular problems that have arisen in the plains area, what have you accomplished? You haven't made a good farming country out of it yet, have you?"

Then he added, "Don't answer if you don't want to."

He left me no choice but to answer. The best answer I could offer was this: To the extent that we have met problems halfway we have made progress. One of our most significant accomplishments recently has been to learn how to tell good land from poor land. When the owners and operators of the High Plains marginal areas learn this and begin to abide by it, we will be pretty near to having a good agriculture on the plains.

Practically all of our recurring difficulties trace back to trying to stretch the capabilities of the land too far.

I have followed the agronomic problems of southwestern semiarid dry farming through three decades. The problem uppermost in the minds of farmers changes from time to time.

During the 1920's it was moisture utilization leading to methods of moisture conservation.

During the 1930's the dust problem was uppermost.

During the 1940's it was the discovery that soil fertility had been going down without anyone suspecting it.

I wish to point out examples of how research findings are being applied in conservation operations in the plains area.

(1) One of our more advanced items of progress in 52 soil conservation districts representing the principal type of farming areas in the High Plains is to maintain current reports of soil-moisture and ground-cover conditions, as a basis for soil conservation technicians and county agents to help farmers in cropping plans and soil conservation operations.

These sample areas extend from Reserve district on the Montana-Canadian border to Dickens County in the cotton belt of west Texas. An early study of the best application of soil-moisture information showed that the initial subsoil store was quite important to the winter wheat crop, but that a general county or area report might be misleading to a farmer as applied to a particular field.

To be of real use he must have a moisture test from the field in question, or from a field in certain essential respects treated like his field in the same rainfall area. With the same land type and slope, the same previous crop, and substantially the same rainfall, two or more fields can be expected to accumulate comparable amounts of soil-stored water.

A cross section of a State by county averages is good for the grain trade but does not help the individual farmer.

In fact, the farmer may have contrasting conditions existing on two fields of his own farm. His information must apply specifically to the tract in question.

I quote an excerpt from a moisture summary supplied by one of our fieldmen in Chase County district in southwestern Nebraska in September 1948.

"Topsoil moisture was completely absent to a depth of 3 inches over the entire county.

"Subsoil moisture varied considerably; the northwest one-fourth of the county having the least, the east one-third of the county the greatest. In the northwest portion continuously cropped fields contained good moisture only between the depths of 3 and 15 inches. In the same area summer-fallow moisture ranged in depth from 24 to 30 inches.

"As a rule the remaining portion of the county had 24 to 36 inches of penetration under stubble fields and 48 inches or more under summer fallow."

A county average in this case would have been very misleading to everybody, as also would any observations short of a thorough coverage of the district.

In comparison, I cite another quotation taken from Central Curry district in eastern New Mexico, also in September 1948. It relates that topsoil and subsoil moisture conditions are quite uniform over the entire district excepting for different methods of preparation.

"The average moisture penetration for the 34 summer-fallowed fields sampled was 35.6 inches. The 42 wheat-stubble fields sampled showed an average moisture penetration of 17.0 inches."

There was no spotty rainfall there, as in Chase County, and all the farmer needed to know to ap-

(Continued on page 22)



# DISTRICT PROFILE

## SILVERWOOD of CALIFORNIA

W. E. (Ted) Silverwood, president of the California Association of Soil Conservation Districts, hails from the heart of the Golden State's citrus country. But citrus is only a side line of this Redlands, Calif., rancher; he also produces peaches, barley, and cattle.

Silverwood operates under the banner of "Let's get the job done!" Busy as he is with his diversified 2,400-acre operation, he finds ample time for promoting soil and water conservation. He moves at a pace that nears a trot.

A few years ago one of Silverwood's friends stopped at his house and asked for Ted. One of his now-teen-age daughters came to the door and said her daddy wasn't home.

"Is he out in the orchard?" the friend asked.

"No," the daughter said.

"Is he out in the grainfield?"

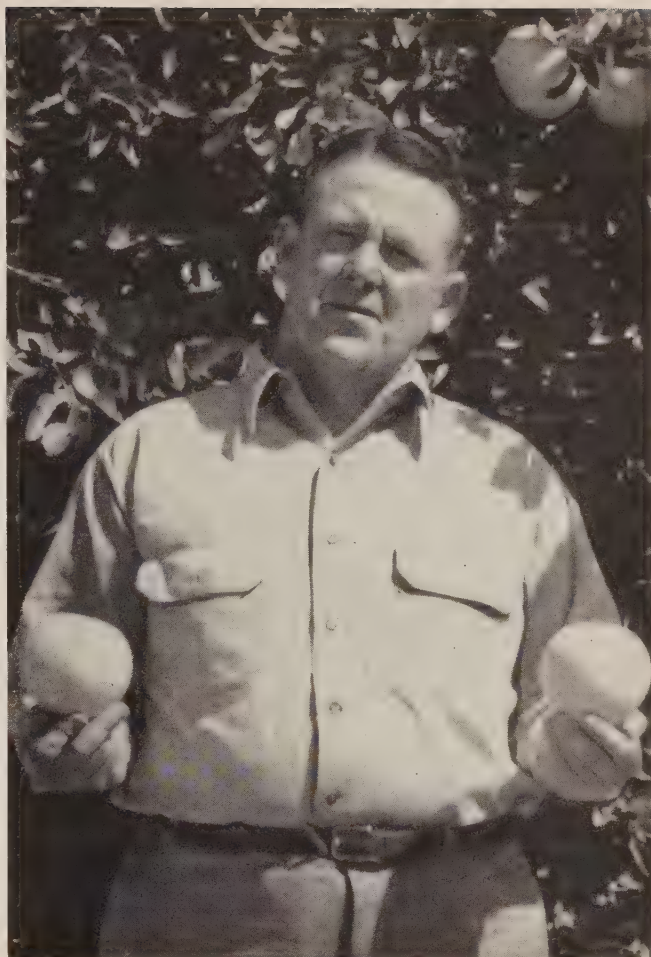
"No, he's not there, either," she replied. "All daddy does nowadays is get dressed up and go to soil conservation meetings."

Silverwood became interested in soil and water conservation during the early forties, and he has been one of California's champions of the cause ever since. He has helped form seven soil conservation districts. He was chairman of the committee that sponsored the San Geronio Soil Conservation District in 1944 and was president of the district board until he moved from Beaumont to Redlands to be nearer the center of his farming and marketing enterprises.

Silverwood and his friends completed the organization of the Redlands-Highland Soil Conservation District in 1949, and since then he has been a director of that district.

When J. M. (Max) Wilson of Santa Barbara became ill in 1950, he called on Silverwood to serve as western-area vice president of the National Association of Soil Conservation Districts. At the 1951 National Association convention in Oklahoma City, the Redlands rancher was elected western vice president to succeed Wilson.

Silverwood's farm lands are in the Redlands-Highland, Yucaipa, and San Geronio Soil Conservation Districts. His main dry-land grain crop



**Ted Silverwood.**

is barley, and in his 300-acre orchard are mainly peaches, apples, and plums. To keep acquainted with the citrus producers' problems, he has a small grapefruit orchard.

He has a variety of other interests. On some of his high-elevation land he is experimenting with lilac varieties for the Los Angeles cut-flower trade. He is also testing varieties of deciduous fruits that might have added appeal in the market. One of his guiding principles is to get his products on the market either before or after the main run.

Silverwood has been studying the water problem in southern California. He lives in an area where the jumping population makes the water supply a live issue. He has immediate personal reasons, too, for the interest. Water companies that serve him and others in the area don't have sufficient supplies, because of recurrent years of low rainfall, to deliver to each farmer sufficient water to meet minimum irrigation requirements. He realized early that ranchers and growers in his territory needed to develop supplemental water and, in ad-

dition, make more efficient use of their present deliveries.

Silverwood has greatly improved the irrigation systems on his properties in carrying out his soil and water conservation programs. He has also put down wells for supplemental water supplies and in some of his orchards he has installed sprinkler systems to stretch his water supplies to the utmost.

He owns 1,800 of the 2,400 acres he operates. The 600 acres he leases are dry-farm grainland. He was one of the first farmers in the San Geronio Soil Conservation District to put in a system of terraces. His first terraces were the subject of much comment since he put them on some of his leased land.

Silverwood's varied interests and community public spirit are illustrated by the groups, other than soil conservation, with which he works. He is vice chairman of the California Fresh Peach Advisory Committee, a director of the Banning-Heights Mutual Water Co., a former director of the Riverside County National Farm Loan Association, and president of the San Geronio Fruit Co.

He is a Rotarian, a member of the grange, a member of the Farm Bureau, and an elder in the Presbyterian Church.

Mrs. Silverwood also is engaged in several community services. A former school teacher, she holds undergraduate and graduate degrees from the University of Southern California. Among other things, she is a member of the Redlands school board. She works constantly with her husband on farming and marketing affairs. Their two daughters are Patricia, 17, and Sally, 15.

Mrs. Silverwood, a gracious wife and mother, is tolerant of the time her husband spends on soil conservation activities. Until he became State president and National Association vice president last February, Silverwood's soil conservation activities kept him away from home mainly in the evenings. Now, however, he has to be away for days at a time.

"I sometimes wonder if Ted isn't absent from his business too much," Mrs. Silverwood said recently. "But then I realize he works long hours and works hard. He works at soil conservation the way some people work at golf. It's about his only recreation, and as long as he enjoys it, I'm not going to complain."

Like most Californians who have a Texas-size pride in their State, Silverwood never misses an opportunity to give his homeland a boost. He would like to have the National Association of Districts convention in California in 1955; so he showed up at the Oklahoma City convention of the Association with several boxes of oranges for the delegates. On each orange was stamped "California in 1955." He also had oranges for Oklahoma's Governor Murray, which he presented as a token from Governor Earl Warren of California.

Silverwood is a forceful and persuasive speaker and has a lively sense of humor. Above all, he believes that farmers must measure up to their responsibility to protect and improve the productive capacity of the Nation's land.

—ARTHUR L. DARSEY.

## THE W-DITCH

By JOHN G. SUTTON



Cross section of W-ditch, approximately 25 feet wide. Rows will parallel ditch on either side.

THE W-ditch (sometimes called "double ditch") was so named because of its shape. It consists of two broad, parallel, shallow channels, spaced about 20 to 30 feet apart. In constructing the ditch all the excavation, or spoil, from the two channels is placed between the ditches. In this way none of the spoil is left on the outside of the ditches where it would block the entrance of surface water draining from adjacent areas. This unobstructed entrance of surface water from both sides of the ditches along the entire length is one of the main advantages of W-ditches. In constructing a single ditch the spoil must be placed on one or both sides where it may block the entrance of some surface water even when the spoil banks are spread.

Note.—The author is head, drainage section, engineering division, Soil Conservation Service, Washington, D. C.





**W-ditch in oats planted 6 weeks previously.**

The W-ditch is adapted to field drainage on flat slopes, commonly ranging in grade from about  $\frac{1}{2}$  percent to about 2 percent. It is ordinarily used for draining land in row crops, although it is equally useful on grazing land and for other field crops. Where used on cropped land the broad, flat slopes of the center berm permit easy crossing with farm machinery. Spaced at requisite intervals in row-cropped fields, these ditches do not seriously interfere with the use of long rows such as may cross a number of W-ditches.

These ditches can be constructed with either a blade grader or a plow. All the spoil is moved to the center. The berm thus formed between the parallel ditches is usually shaped and smoothed and sometimes serves as a farm road.

Maintenance can be provided by plowing toward the center at the time the field is plowed. During the crop season each cultivation (across a W-ditch) produces small ridges across the channels. Once through with a turning plow is sufficient to remove these obstructions from the channel.

This type of ditch is being used on farms of the Mississippi Delta country, and to some extent in other localities. Such widespread use has resulted principally through the spread of soil conservation work.

W-ditches are not used where large channel capacity is required. For large areas the V-ditch or the trapezoidal channel is used. The W-ditch has

proved another useful tool for the engineer's kit.

The advantages of the W-ditch may be summarized as follows:

1. Provides excellent row drainage because there are no berms or spoil banks on the outside of the ditch to obstruct entrance of water from the rows.
2. Does not interfere with farming operations. It is not necessary to limit row length or break up a field into blocks bounded by ditches.
3. Can be constructed with plows available on the farm or with blade graders. Expensive ditching machines are not necessary.
4. Maintenance is accomplished as part of the ordinary plowing operations. Little extra work is required for maintenance.
5. The center berm may provide a raised road-bed through flat, wet areas.

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**YOUTH AND TREES.**—Members of the New Fairfield (Conn.) 4-H Club one day recently planted 1,000 white pine seedlings in a tract of the Andrew Delohery farm that had been recommended by SCS technicians for reforestation because it was unsuitable for pastures or crops. The boys bought the trees as a club project, cut brush to prepare the site for planting, painted steel fence posts, and helped build a fence to keep out cattle. They have taken the responsibility of keeping the tract free of brush and brambles that would crowd or shade the young trees and prevent full growth, and will annually plant more trees.





## COLLECTION KEEPS GROWING

EVERY now and then, purely as a matter of covering the news on the conservation front, this magazine tries to catch up with the inflow of honors coming to the Chief of the Soil Conservation Service.

To Cincinnati in April went Hugh Bennett to receive its highest award—the Founders bronze plaque—from the Izaak Walton League of America, which was meeting in its twenty-ninth annual convention. The secretary of the awards committee, William Voigt, Jr., in asking Dr. Bennett to be present, noted that “We had before us for consideration a full score of individuals and organizations, including authors, State and Federal Government agencies, and institutions composed of private citizens. After weighing the accomplishments of all carefully, we felt there was none more worthy

of receiving the award this year than you, the acknowledged ‘father of soil conservation’ in America.”

The citation read: “For distinguished service and outstanding achievement in furthering the conservation of soil resources to an extent unparalleled by any individual in recorded history.”

To New York in September 1950 went Hugh Bennett to receive from Friends of the Land perhaps the most unique award of all: to be the first recipient of the Hugh H. Bennett gold medal, to be given annually hereafter “For outstanding contributions to the cause of conservation of soil, water and man.”

To Eagle River, Wis., in October 1950 went Dr. Bennett to receive from The American Forestry Association a recognition which could not be conferred the year before because of the Chief’s absence from the country. The award consisted of life membership in The American Forestry Association, and a walnut plaque bearing the bronze shield of the association and inscribed: “In recognition of outstanding service in the conservation of



American resources of land, water and forests.”

More recently, at Jackson's Mill, W. Va., the Chief was made an honorary member of the State Association of Soil Conservation District Supervisors and given a 10-year pin.

“Outstanding achievement in preserving the heritage of farm youth” reads a wooden shield with metal emblem mounted thereon, from the 4-H Clubs of Harford County, Md.



Left to right: Blaney, Mitchell, Edminster, Caton, Chief Bennett, Dell, Garber, Crider.

**HONOR AWARDS.**—The fifth Honor Awards Ceremony was held in Washington May 15 to accord appropriate recognition to individuals or groups whose work for the Department of Agriculture has been exceptional.

Ten times the garland came to the Soil Conservation Service! Winning Superior Service Awards were Harry F. Blaney, Winfield S. Caton, Franklin J. Crider, Harry H. Dell, Talcott W. Edminster, Norman E. Garber, and Homer C. Mitchell. Unit awards came to the Cimarron (N. Mex.) Work Group, the Hinton (Okla.) Work Group, and the Northern (Utah) Work Group. For the first time, too, an employee of the Service received the much-coveted William A. Jump Memorial Award.

As a memorial to the great William A. Jump, a gold key and certificate are awarded annually to an employee of the Federal Government who is not over 32 years of age, and whose performance demonstrates unusual competence and interest in public administration, endowment for leadership, and close adherence to the basic principles of enlightened public service and consecrated devotion to duty.

Double-winner Talcott W. Edminster was acclaimed (Jump Award) “For outstanding and inspired leadership in public administration, particularly for his original contribution and unique accomplishment in drawing together the efforts of many different groups—farmers, community leaders, college and State officials, and Federal agencies—to effect the unified administration of soil and

water conservation research programs in the southeast United States.”

And again (Superior Service Award), “For his leadership in unifying the efforts of many different groups toward development and carrying out of a soil and water conservation research program that has solved many soil and water conservation problems in the Southeast.”

## NATURAL GROUPS SPEED CONSERVATION

By **ALFRED M. HEDGE** and  
**HOWARD W. REAM**

**O**NE of our tasks is to speed up the application of soil conservation measures. We are constantly searching for better ways to do this. The Service realizes that working individually with each farmer or rancher on all phases of the soil conservation program is an expensive as well as an almost impossible task.

As early as 1935 some attempts were made to work with *groups* of people, principally on a watershed basis, in CCC camp areas and in demonstration projects. During the past 15 years we have worked with about every kind of rural group there is. With the advent of soil conservation districts in 1937, much interest was generated in group action. The soil conservation districts, through the coordinated efforts of the Extension Service and the Soil Conservation Service, carried on effective educational programs through organized (man-made) groups of all kinds, such as farm organizations, community clubs, civic groups, schools, 4-H Clubs, etc. Even today these efforts continue to pay big dividends.

At the same time, the districts began work with small groups on farm conservation planning activities. For the most part these were hand-picked, more or less artificial groups. They were organized or came into existence in a number of different ways. The district supervisors sometimes called together in their localities interested farmers. Or

Note.—The authors are, respectively, assistant chief of operations, and soil conservationist, Soil Conservation Service, Washington, D. C.

they circulated petitions or had other people pass petitions around to secure the names of farmers who were willing to meet together to discuss soil conservation. In some districts, farmers who requested assistance were asked to go home and get their neighbors together, or were given a group-organization petition to circulate. Some groups were organized on a school-district basis, others by getting owners or operators of contiguous farms together, and still others on a watershed basis. Many groups were organized after the soil conservationist or the county agent selected the people and invited them to attend meetings. In fact, every known method of organizing groups of people was tried.

Considerable success attended this effort, but we also encountered many problems. It was oftentimes difficult to get attendance. So much depended upon the abilities of the person conducting the meeting. He virtually had to be a "spell-binder" to keep attendance up. In fact the work unit conservationist too often had to "ramrod" the endeavor at every turn to make it successful. Even then, many of the groups that functioned effectively in farm conservation planning activities were not so effective in getting conservation measures applied to the land.

Nevertheless, this early work with "organized" or "man-made" groups was very worth while. Field personnel who used effective techniques in working with groups were able to do their job better, easier, and faster than when working with each farmer individually. Training given in group techniques enabled Service personnel to do a better job of dealing with people.

Likewise, these experiences caused Soil Conservation Service technicians to study the groups with whom they worked. Many times they raised the questions:

"Why do some groups function better than others?"

"What motivates people in these groups to become conservationists?"

"How can we do a more effective job in group action?"

These questions aroused considerable interest in the subject, not only in the Soil Conservation Service, but also in the Extension Service and Bureau of Agricultural Economics. Numerous discussions between these agencies in Washington and in regional offices were held. In 1945 the Service em-

ployed Dr. John P. Shea to study this problem and to train Service people in the principles of working with groups of farmers and ranchers in soil conservation.

Shea worked with Service personnel and collaborated with such men as Carl C. Taylor and the late Nat Frame of BAE; Douglas Enslinger and E. J. Neiderfrank, Extension Service; Charles P. Loomis and Paul Miller, Michigan State College; Carle P. Zimmerman, Howard University; and C. V. Lively, University of Missouri. Shea advanced the idea of locating and working through *natural* groups.

*Natural* groups are made up of people who habitually associate with one another because of needs, attitudes, customs, modes of life, and beliefs. The family, the neighbor group, the neighborhood, and the community are all natural groups.

These groups come into being by natural processes, develop slowly, and endure because they serve continuing needs of the members. This is in contrast to *artificial* or *man-made* groups which are formally organized for special purposes, such as farm organizations, civic clubs, garden clubs, school districts, organized extension or soil conservation groups, and the like.

The natural group approach involves knowing and working with community and other over-all leaders whose opinions are respected. Such leaders can aid in education and information programs and in various ways stimulate farmers and ranchers as well as the general public to become conscious of and to recognize soil conservation problems. Equally as important, and more basic, to the development of conservation farmers and ranchers is the identification of neighbor groups and their leaders. Many farmers and ranchers believe that the best way for them to improve their understanding of conservation and speed up the establishment of conservation programs on their farms is through their neighbor groups.

The term "neighbor group" as used by the Soil Conservation Service should not be confused with "neighborhood." Rather a "neighbor group" is very similar to groups described by various authors as "informal," "friendship," "mutual aid," or "congeniality" groups. The neighbor group is a group of families bound together by mutual likes, interests, and needs. The most enduring and effective type of cooperation among farm people occurs in these groups of farm families who visit, borrow, exchange work, discuss their problems and ideas,



and engage in numerous other activities. Within such groups there are always one or two "good neighbors" who are looked upon as being the most willing to help the others in the group. These "good neighbors" are the group leaders who are most often looked to for advice, and who, if they try something new, are most likely to be emulated.

Because of these characteristics, neighbor groups afford the most logical and natural way in which to work with people in soil conservation. For the most part their meetings are informal. One can frequently observe such informal gatherings on street corners, at auctions, at the crossroads store, or preceding or following large meetings of "artificial groups." In such huddles or at more formal neighbor-group get-togethers, people discuss things more freely and participate more actively in projects of mutual interest than at larger meetings where they don't know most of those in attendance. Here ideas are stripped of fancy trapping, discussed, analyzed, and revised. Here is where soil conservation becomes a part of the group's way of thinking.

From 1945 to 1947 these principles were discussed with Service people at regional, State, and work group meetings. However, not until a definite practical technique for locating natural groups and leaders was worked out, and training given through actual interviews with farmers by persons experienced in these techniques, did the idea begin to be accepted. Only by consulting with the members themselves can one positively determine the membership and accurately identify the leader of a natural group. Briefly, the steps followed by Service personnel are these:

1. Consult with several over-all district, or county-wide, leaders to obtain the names of the more important community leaders.
2. Talk to these community leaders and gather all information possible about neighbor groups and their leaders.
3. Using the names secured in this manner, talk to enough people in each neighbor group to verify the membership of the group and determine as positively as possible who the leader or leaders are.
4. Consult with the leader and check with him as to the membership of the group. Let him decide where borderline cases fit. Likewise, find out from him whom he considers to be the real community leaders.

5. With the leader, determine the group's interest and understanding of soil conservation. Plan with him the course of action to be taken to help the group to move along in soil conservation work.
6. Ask community and over-all leaders to encourage and assist the neighbor-group leaders.

Training Service personnel, on site, in these methods began early in 1947. Up to this time, with but few exceptions, all work unit conservationists and district conservationists have been taught these principles and techniques by on-the-job training methods. Likewise, most of the aids and soil scientists and many of the other technicians at the work unit, work group, State, and regional levels have been trained.

Considerable progress has been made in locating and working with neighbor groups in soil conservation districts throughout the country. Up to December 31, 1950, the Soil Conservation Service had located approximately 33,000 neighbor groups, consisting of more than 284,000 farm families. Of the groups located so far, one or more activities in connection with planning, application, or maintenance of soil conservation work have been carried on by nearly 24,000 groups.

While accomplishments have been very satisfactory, much remains to be done to get wide-spread understanding and adoption of the neighbor-group approach.

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**NEIGHBORS MEET A PROBLEM.**—Last year cotton failure on 50,000 acres of sandy land in the Farm Security (Okla.) Soil Conservation District left large areas exposed to blowing. The worst of it was that farmers in the area, for various reasons, had repeatedly experienced cover-crop failures.

A chief bottleneck was the lack of grain-fertilizer drills. The drills, hard to find, were obtained with the help of the district board and local banks, which provided financing at a low rate of interest. A whirlwind hunt turned up 10 drills, all of which were purchased by neighbor groups. Also made available were adequate supplies of fertilizer, rye seed, and hairy vetch seed.

When the project was wrapped up, its results could be simply stated: The largest acreage of cover crops ever seeded in the district—more than 3,500 acres put in vetch, rye, and alfalfa—reduced erosion, enriched soil.

Neighbors, working together under the supervisors' leadership, got the job done.

—RALPH H. GIECK.

# CONSERVATION IN NORTH CAROLINA

By BARRINGTON KING

**E**LEVEN farm families, neighbors constituting a "natural group" in the Central School section of Iredell County, near Statesville, N. C., have teamed together under a single conservation plan, at great advantage in time and cost and all-around efficiency. Teamwork is not new to these families. They worked together to get electric lights and power, telephones, a milk route, and a hard-surfaced road. They joined in support of churches, schools, and recreation for their children. Cooperation became a habit—a most profitable habit.

They found that in many undertakings the sum of accomplishments of the group far exceeded what could be done by the same people working as individuals.

Soil conservation, logically enough, became a group undertaking. The result is a single land-capability map, a single land-use map, and a single plan of conservation operations for all of the 1,165 acres in the 11 farms.

Every member of the group has a copy of the plan and each knows what it calls for in detail. He knows his own land, as well as his neighbors' land. He knows his own problems and also those of each of his neighbors. He knows what each must do—when, where, and how. It's a unified—group—program, 100 percent.

But let Roy Weber tell you the story in his own words, as he told it to a group of SCS workers from North and South Carolina recently at a meeting in Winston-Salem, N. C.

"I know my neighbors.

"Why do I know them?

"I work with them. I see them. I talk with them.

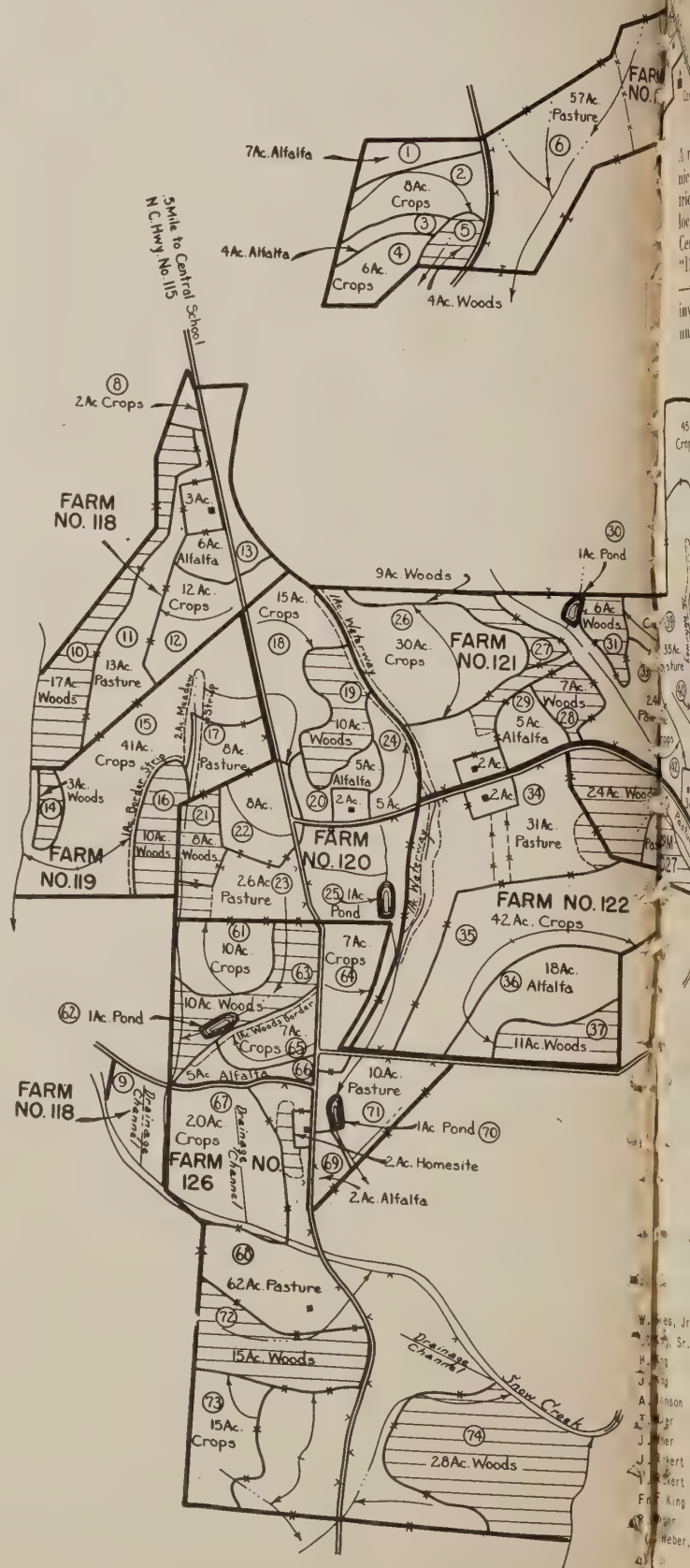
"What do we stand for in our group?

"Good churches, good schools, good living, good sports for our young folks.

"Why are we interested in soil conservation?

"Because without it—without keeping our soils productive, without keeping our land from washing away—we cannot have these things.

Note.—The author is chief, regional division of information, Soil Conservation Service, Spartanburg, S. C.







"After these maps were prepared, before Julian got them distributed, those telephones began ringing around the neighbor group.

"Has Julian been around with the map?"

"A newspaper article appeared in the paper. The telephones rang again.

"Did you see the article? I see so-and-so's name—by gosh, *all* our names are in there!"

"We are happy. We are working together. We appreciate the fact that someone was interested in us and recognized us in the newspaper.

"There are 11 families of us on 1,165 acres.

"We have 139 milk cows on these farms. We have all the milk we can drink and all the butter we can eat, and we produce plenty of additional milk to furnish our city friends.

"We have 1,500 laying hens.

"We have over 50 head of beef cattle and have all the meat we need with some left over to sell.

"There are 51 people in all. The women and girls don't work in the fields. They are real homemakers. Some of the girls are in college. The boys are not going to town for jobs. They are happy on the farm.

"Are we interested in just the neighbor group?"

"No, we are interested in the community, in North Carolina, and in the Nation. We like to see other folks happy too. The unhappy ones are those who are grumbling all the time, or whose buildings are falling down because their soil is going down hill."

Weber was asked where the group got the "spark."

"If you go into any neighbor group there is always someone who has a 'spark,'" he replied.

"All you need to do is find it and set it off. Usually a blaze will result.

"We have a group that loves to fish. There are five ponds in the group and we fish with the neighbors. They like to have us come and fish with them in their ponds.

"We like the Soil Conservation Service men. When they come out to see us they are dressed in work clothes. They are ready to work and help us with our problems. They don't come out to 'tell' us what to do. They come out to see what we are doing or going to do. And, believe me, while they are finding out what they want to know, we waste no time in finding out what they know."

Members of the group include Roy Weber, J. C. Weber, T. M. Rickert, J. H. Rickert, A. E. Johnson,



One of the five ponds on group's farms. Beef cattle in background belong to Frank and Richard King.



A baseball game in progress on ground of Central High School, a modern school of which the group is very proud.



Harvesting mixture of alfalfa and oats which will be dehydrated for dairy feed, on farm of J. H. Rickert and Sons.

John S. King, H. H. King, Frank King, Richard King, James H. King, and W. C. Sykes, Jr., and their families. Altogether, including the children, there are—as Weber noted—51 members altogether. Oldest member is Mrs. Henry S. King, about 80, mother of Frank and Richard.

The children, Roy Weber points out, are extremely important, since they represent a new generation growing up in the community. Two of the girls, Betty King, daughter of Mr. and Mrs. Richard King, and Ellen Rickert, daughter of Mr. and Mrs. J. H. Rickert, are attending North Carolina Woman's College at Greensboro. Betty plans to be a home demonstration agent and Ellen is majoring in library science.

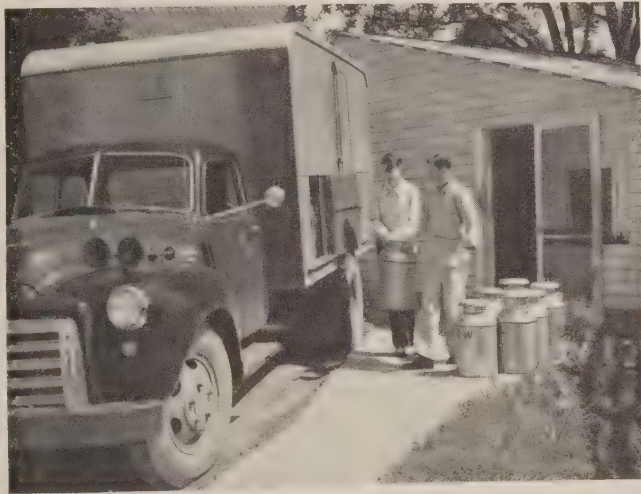
The group is proud of Central High School. Frank King is chairman of the county board of education, and J. H. King is on the Central High School board. There are two active churches—Snow Creek Methodist and Clio Presbyterian.

Maybe it's because of the younger generation that the group attaches so much importance to rec-





**Registered Jerseys in Roy Weber's pasture of Ladino clover and orchardgrass.**



**This milk truck picks up around 250 gallons of top-quality milk each day from farms in Weber group, for retail sale in Charlotte, N. C. Here's a pick-up at Roy Weber's farm.**

reation, but the older ones like their fun too. Most of the Kings are baseball and football fans; the Rickerts, J. C. Weber, and A. E. Johnson are fishermen, and Roy Weber and the Sykes are primarily interested in Jersey cattle and saddle horses. But all of them like to fish and hunt.

T. M. Rickert is 73, the oldest man. Several years ago he and J. H. Hiatt, who was then the presiding elder of the Methodist Church went squirrel hunting. Just as Hiatt got a bead on a squirrel and pulled the trigger, Rickert stepped in a yellow jackets' nest.

"Oh, Brother Hiatt," Rickert yelled, "you've shot me."



**Carl Julian, farm planner, and W. C. Sykes in field of barley on latter's farm.**



**J. H. and T. M. Rickert in latter's alfalfa field. Yields average 3½ to 4 tons per acre. Dehydrated alfalfa meal sells for \$65 per ton for use in chicken feed.**



**Some of the group at informal gathering on A. E. Johnson lawn. Seated: W. C. Sykes, Jr., Roy Weber, Carol Weber, W. C. Sykes, III, Jimmy King, Cooper Sykes, T. M. Rickert, A. E. Johnson, J. H. Rickert, Bill Johnson, Richard King, Jim King, J. C. Weber, Frank King, and Robert Weber. Standing: Mrs. Roy Weber, Mrs. W. C. Sykes, Jr., Mrs. T. M. Rickert, Mrs. J. C. Weber, Mrs. A. E. Johnson, Mrs. Richard King, and Mrs. J. H. Rickert.**



Hiatt couldn't figure how that could be, as he had shot at a squirrel high on a limb of a tall oak. But the blast of the gun and Rickert's yell coming at the same moment was almost convincing. So Hiatt "broke" his gun and ran over to see how the victim was.

Just as he got there, Weber relates, three or four of the yellow jackets popped him, and cleared up the mystery.

Maybe there's a parallel in this story to what has spurred the neighbor group into action in their joint conservation program. Roy Weber got bitten by the conservation bee and his close friends came to see what was going on. And when the mystery had been cleared up, things began to happen in soil and water conservation.

Getting conservation on the land in Iredell County hasn't always been that simple. Carl Julian, who started as a farm planner in Iredell 10 years ago, recalls that during his first year he used to write farm plans and couldn't get farmers to sign them.

They would say, "I've been talking this over with John Smith, and he doesn't think it's the thing to do."

Or maybe it would be, "I don't believe I'll put this meadow strip in. John Smith has a good farm and he doesn't have any meadow strips."

This had been going on for some time when Julian decided he had better find out who this John Smith was.

When he found him and talked over the conservation program, John Smith decided he wanted a conservation plan on his farm. He said he never had understood about conservation work before, because it hadn't ever been explained sufficiently to him.

After that, Julian found that it was a lot easier to get together on conservation plans with John Smith's neighbors. And he began to find out, too, that there was a "John Smith" in *every* group, and that once he was located and interested in a sound soil and water conservation program, the job of planning and application in his group became much simpler.

Julian was still learning these things the hard way when A. H. Chapman and George Dickinson from the Soil Conservation Service office at Spartanburg, S. C., went to Statesville to test out a method of locating natural groups and leaders.

"They cleared up my thinking on how to locate

natural group leaders, and verified the things I was finding out by trial and error," Julian recalls.

The survey that was started at that time to identify such groups and leaders was completed last summer. It showed 270 neighbor groups, averaging about 10 members each. Since the first of the year, a joint plan of operations has been developed for five of these groups and Julian and his associates are working with 30 other groups which are in various stages of planning and application of group conservation programs.

The Duke Power Company owns 15,000 acres of land, most of which is leased to tenants and is operated for watershed protection in accordance with sound soil and water conservation measures. Julian is working in this area, too, through Fred Brotherton, land agent for the company. As old tenants leave, a district plan is worked out for each new tenant.

On all other land in the county, contacts are made through the natural group leaders, and conservation plans are developed on a neighbor group basis.

"All people are on somebody's team," Julian comments. "The trick is to get the team playing the conservation game. Once you get them interested in conservation of their soil and water resources, it gives them a neighbor group bond that makes them a stronger team than ever before."

The Weber neighbor group is convincing proof of what Julian says. They are playing the conservation game with the energy and enthusiasm of a team that's out to roll up a winning score. With Roy Weber in there calling signals, this 11-man team will bear watching for a good many seasons to come.

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**CONSERVING WATER AND CASH.** — Kelly Brothers, dairy farmers near Perry, N. Y., have discarded their 300-gallon water tank. Annually they had hauled water—two or three loads a day for as long as 6-month periods—for their herd and other uses on the 580-acre farm. The water cost them 50 cents per load plus their time and the use of a truck in hauling it 3 miles each way. They built a 1½-acre farm pond that cost them \$350—less than 1 year's cost of buying and hauling stock water. The pond, designed by SCS technicians working with the Wyoming County Soil Conservation District, holds 600,000 gallons. It provides fire protection and fishing, since it is stocked with bass and bluegills.



## "A Service of Extreme Value"

Department of State  
Washington  
May 23, 1951

My dear Dr. Bennett,

Because I have had such a fine experience with your Service specialists in connection with my farm near Millbrook, Dutchess County, N. Y., I feel impelled to write you a letter commending your work. I have found the services and facilities available through the Dutchess County Soil Conservation District to be of inestimable value, particularly the technical assistance made available by the Soil Conservation Service. I wish to thank you for the assistance given me by Mr. Harrison Cassell, Jr., your soil conservationist. His technical know-how, his loyalty to the Department of Agriculture, his encouragement, and his advice to me have been of priceless value, and I wish it were possible that all farm owners could benefit by his constructive criticism.

On my 466-acre farm we are following a 5-year crop-rotation plan with the cropland being farmed in contour strips. Later some diversions will be installed. Several pastures remain to be reseeded. At present we have a 4½-acre pond under construction which is to be stocked with trout. The farm now carries 80 registered Holsteins of which 50 make up the milking herd. We plan to increase this number somewhat as our farm land is improved. The Department's pamphlets on various phases of conservation, as well as those on livestock, etc., have been extremely valuable.

As the "father" of soil conservation you have much to be proud of in the organization which you head. The high type of personnel and the technical job which they are doing in combination with the facilities of the local soil conservation district, provides a service to farmers that is of extreme value to them and to agriculture.

I believe in flowers to the living, and desire to hereby pass along my highest praise for Secretary Brannan's and your efforts along these lines.

Sincerely yours,  
(Signed) RICHARD C. PATTERSON, JR.  
United States Minister  
to Switzerland.

Dr. Hugh Bennett, Chief,  
Soil Conservation Service,  
Department of Agriculture,  
Washington 25, D. C.

## KATIE GETS THINGS DONE

By ROSS H. MELLINGER



Kathleen E. Stephenson

AFFECTIONATELY known to her friends as "Katie," Kathleen E. Stephenson is synonymous with agriculture in Wetzel County, W. Va. She expends boundless energy on behalf of rural interests in rugged Wetzel County.

In 1947 she originated the idea of holding the Wetzel County Conservation Week, now in its fifth year. It was the first organized program of its kind in the State and set a pattern now followed by most other West Virginia counties. As a result, soil and water conservation and good land use have become the business of practically everybody in the community.

Katie went to work for the West Virginia Extension Service as a 4-H Club agent in Mason County

Note.—The author is the Soil Conservation Service representative stationed at Elizabeth, Wirt County, W. Va.

in 1928. She came from a local farm and easily got acquainted with the farm youngsters and their parents. It was in 4-H activities that Katie learned that any farm program, to succeed, must start with soil.

"I began to realize from visits to farm families that we were missing a lot by not going back to the land to begin the needed broad-scale improvement in farm life," she explains. "Many of the 4-H children did not have much to work with simply because the farm family lacked good soil resources."

Katie has always made the most of her opportunities to understand agriculture's complexities. In the fall of 1931 she became home-demonstration agent—the only extension worker in the county. Besides performing as "home dem" agent, Katie organized 4-H Clubs, took care of Triple A's corn-hog program, organized women's groups in WPA activities, and attended to the myriad things that ordinarily gravitate to a county agent.

Five minutes spent in Katie's office is an eye-opener. She will place a telephone call, sort mail, jot down notes, straighten up her desk, talk with office callers—all at the same time. And at the end of day she may suddenly observe with seeming surprise: "Gosh! I believe I'm about to lose my feeble mind."

During the war Katie, of course, was in the thick of things, helping organize bond drives, promoting the food-conservation program, writing to numerous 4-H friends in the armed services.

After the war, when USDA councils were organized, Katie became an enthusiastic member. Soon she discerned a need for closer coordination of all agency representatives to carry out an effective agricultural program. Recalling her 4-H experiences and the need for starting with the soil, Katie thought that the council would be a good vehicle for emphasizing the importance of soil conservation, because soil conservation is everybody's business—not merely that of agricultural specialists and farmers. With characteristic foresight, she proposed early in 1947 that the council sponsor a Conservation Week in the fall.

This first fully organized Conservation Week in West Virginia was one of the first in the Nation. Virtually everyone had a chance to participate. Schools, churches, youth groups, business organizations, townspeople, farmers, agricultural workers—they all had a place in the program.

So successful was the first Conservation Week that Katie got the council to make it an annual Wetzel County affair. It is bigger and better every year. In 1948 a minor face-lifting job was featured. In 1949 forestry was the theme. And in 1950 grassland farming took the stage.

Conservation needs of Wetzel County are the basis of all activities. Most important among these needs are the wise use and management of grasslands and forests. To help bring these needs to the attention of more citizens, Katie came up with an idea for a Wetzel County seal to be featured by cooperating agencies and other people. It carries the slogan "Long May Our Land Be Green—Grow More Grass and Trees," which is widely used.

The 1951 program centers on trees and grass. A calendar has been developed to cover activities every month through the year and give everybody an opportunity to participate. Events include a woodland-management campaign, forestry and grassland demonstrations, a radio program, farm tours, and 4-H demonstrations.

Of particular interest is the way State-wide programs are integrated. Such events as the West Virginia "Greener Hills" campaign, Arbor Day, and the Tree Farm, 4-H conservation, and other programs take their proper places and add emphasis to local activities.

Katie's work for conservation is not bounded, however, by season or calendar dates. She is constantly on the lookout for ways to work conservation into other things she does. Her farm women's clubs carry out a cover-crop campaign during which they put the pressure on husbands to get a cover crop seeded on the garden and the rest of the land, too. The 4-H Clubs are always endeavoring to promote conservation. During 4-H camp, special activities are developed around the conservation theme. One of Katie's 4-H conservation forums puts to shame many adult forums on the subject.

You might think that after all this, there wouldn't be much else required. But remember, Katie thinks that conservation is *everybody's* business, so she concentrates on newspapers, radio, and other media to let everyone know what's going on. After she gets through organizing a campaign, anybody who has ears or eyes within 200 miles of New Martinsville knows what's going on in Wetzel County.

She is personally acquainted with every news-



paper editor, photographer, radio farm-program director, and agricultural worker for miles around. If there is any way at all to search out a publicity angle, Katie finds it. Much of the stuff she writes herself; the rest she gets by asking, begging, flattering, scaring, or coercing. You really haven't arrived in Katie's inner circle until, in one of her impatient moods, she has called you a "hammer head!"

All this might lead to the conclusion that Katie spends all her time on conservation activities, but her "regular" duties are accomplished as well. She has 9 farm-women and homemakers clubs with 233 members, and 29 4-H Clubs with 500 members that she and County Agent Kittle helped organize and keep functioning.

There is no doubt that Katie is the prime mover in Wetzel County's conservation-education activities. She has lots of help from others, but most of the ideas, planning, and action stem from Katie and her ability to get things done. That, coupled with her sincerity, enthusiasm, and desire to be helpful to farm people, is why Katie is recognized as a real agricultural leader.

## SOIL WAS DEAR TO HIS HEART

By OTTO F. BAUMANN

**T**HE Theodore E. Ruess Memorial Plaque was recently awarded to the Millstadt Consolidated School of the Shiloh-O'Fallon (Ill.) Soil Conservation District, and presented by State Grange Master Dorsey Kirk.

The thought expressed by many of those present was: "How happy Ted Ruess would be if he could know that a movement he cherished will be carried on in his name through the children of his own community, many of whom will soon be real soil conservationists on their own farms."

The late Theodore Ruess was a pioneer in soil conservation in his community. Even before a district was organized, he had a good soil conservation program on his farm near Belleville. His were the first terraces in the county. He was the first chairman of the Shiloh-O'Fallon Soil Conservation District, which was organized primarily under his

Note.—The author is soil conservationist, Soil Conservation Service, Belleville, Ill.



The late Theodore Ruess explaining his farm conservation plan to visiting teachers and Rotarians in 1946.



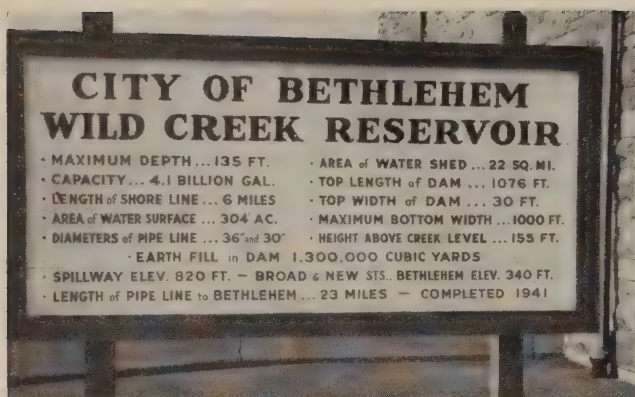
Left to right: Hugo Haertling, chairman, Shiloh-O'Fallon Soil Conservation District; Dorsey Kirk, master, Illinois Grange; Gilbert Fischer, district director; Mrs. Frieda Pulliam, teacher, Millstadt School; Elmer Dickhaut and Gene North, district directors.

leadership. This was the first district in Illinois. Ruess worked and studied constantly to improve his already good methods of caring for his soil.

In memory of his love of the land and his concern for its care, the Ruess family, after his death, May 28, 1950, made a contribution to the district to create a soil conservation memorial to him. Proceeds from the contribution will be used to purchase yearly subscriptions to SOIL CONSERVATION Magazine for student winners of an annual soil conservation poster contest.

State-wide recognition also came with the establishment of the Ruess Memorial Award. This award was financed by the Illinois State Grange in cooperation with the directors of the home district and the county superintendent of schools. The winner of the award is selected each year by the district governing body and is based on a score sheet given to each school entering the contest. Soil conservation scrapbooks and posters, essays, field trips, and other activities are considered in the rating. The plaque is a traveling award and will be kept by the winning school for 1 year.





# THE CITY WITH A FARM PLAN

By H. R. FRANTZ

**T**HE city of Bethlehem, Pa., is the first city or town in the Delaware River Basin to have a complete farm plan, but it is not unusual for Bethlehem to be first. The first waterworks in Pennsylvania was started in Bethlehem in 1755, and recently the city has become nationally known as the first Christmas City.

In 1939 the city bought a large tract of land in the Pocono Mountains embracing Wild Creek watershed and built a water-supply reservoir, from which a 23-mile pipe line extends to the thirsty city.

By 1950 the city-owned 9,600-acre watershed surrounding the reservoir was beginning to demand attention. Forest fires, brush intrusion, and soil erosion were taking their toll of the forest cover and exposed fields, threatening eventual reservoir contamination. A preliminary survey by the city water department showed the immediate need for forestry assistance and advice on soil conservation practices.

At a meeting with Mayor Schaffer and City Council, the conservationist for the Interstate Commission on the Delaware River Basin (INCodel) suggested that the city take advantage of the services offered by the Carbon County Soil Conservation District, in which the watershed is located. It was explained that the district had a memorandum of understanding or operating agreements with the Pennsylvania Department of Forests and Waters, Pennsylvania Game Commission, Pennsylvania

Highway Department, and the United States Soil Conservation Service, and that they, through the district, would be glad to cooperate with the city.

The city signed an application for assistance, which was accepted by the Carbon County Soil Conservation District directors. A soils man from the Soil Conservation Service, after establishing the property lines on an aerial photograph, surveyed and mapped the soils, slopes, land use, and erosion in the watershed. The Department of Forests and Waters, in cooperation with the INCodel conservationist, made a detailed fire plan and divided the watershed into various areas for management purposes.

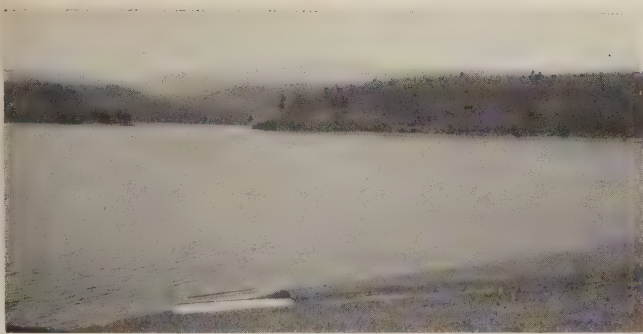
An SCS farm planner, using the conservation survey map, made a complete conservation plan for the area and shrub- and tree-planting recommendations for the idle fields and cleared areas. Where streams and drainage ditches were eroding, especially in front of the dam, gully-control structures and stream-bank-control measures were recommended.



Gully from drainage ditches in front of dam.

Note.—The author is conservationist for the Interstate Commission on the Delaware River Basin, Philadelphia, Pa.





**Wild Creek Reservoir.**



**Newly constructed fire lane along game-propagation area.**

The City Council, appreciating the coordinated field work done and the constructive recommendations contained in the farm plan, went along 100 percent. They purchased a bulldozer to build the required fire lanes and access roads and construct the conservation structures in the streams and drainage ditches. As soon as the bulldozer arrived, the city engineer, the superintendent of the water department, and the farm planner were on the job constructing rock check dams and applying riprap in the gullied portions of the water courses. The gully banks were then sloped and planted to *Wichura* and *Rugosa* rose and other vegetation.

The complete fire plan was carried out. Along with fire-lane and access-road construction, the plan called for the building of a small fire tower, the purchase of fire-fighting equipment, and the organization of a fire-fighting crew.

Fifty thousand trees were planted this spring. This brings the total number of trees planted on the watershed to date to over a million. Plans were made to commence improvement cuttings and thinnings next winter in the compartments and plantations designated by the foresters.

The Pennsylvania Game Commission fenced in a 200-acre plot as a game refuge to be used for game propagation. The watershed contains some of the

best hunting grounds in the Delaware River Basin and it might be said that this is the one farm plan in the country on which four black bears were shot in one season. Except for the area immediately surrounding the reservoir and the game propagation plot, the watershed is open to sportsmen.

Although this farm plan was not designed to produce agriculture crops, it will produce a crop that means more healthful living and stabilized industry to the 76,000 inhabitants of Bethlehem. That crop is sparkling, clear cool water. A by-product will be forest products from the managed timberlands and plantations, and hunting and recreation which can't be measured in dollars and cents.

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**TREES PIN DOWN INVESTMENT.**—Boyd Fortney is reestablishing the 103-acre York County, Pa., farm where he was born in 1909. It is all going into trees. The 25 acres not already in woods will be afforested.

Fortney is in the York County Soil Conservation District. His conservation plan was made with the help of Melvin Blish, SCS conservationist, with cooperation also from the Pennsylvania Department of Forests and Waters, the State Game Commission, and the Gladfelter Pulp Co.

He started his project this spring by planting 13,500 tree seedlings, planting largely by machine. He took the first profit by cutting 1,000 locust posts for sale to the Pennsylvania Highway Department. Mr. and Mrs. Fortney believe that the farm will prove a solid investment to turn over to their sons, now 9 and 5 years old.

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**LICKING FLOOD WATERS.**—By establishing an open drainage system that successfully handles floodwater, and developing a grass tolerant to frequent flooding, Walter Huber, of the Dutchess County (N. Y.) Soil Conservation District is able to use a 37-acre tract along Webatuck Creek, near Armenia.

This bottom land had always been kept in native grasses that provided little good pasture because it was subject to frequent floodings. There were many pockets and irregularities, in which water stood for long intervals.

A long, broad-based ditch was designed and constructed under supervision of SCS technicians, which picks up the runoff from the adjacent hill and carries the floodwater from the pockets into the river at the end of the pasture. Half the field was seeded to reed canarygrass and Ladino clover in 1949, and the remainder in 1950. The 1949 seeding provided excellent pasture in 1950 and the whole field now is in good production for grass, silage, and pasture. There has been no damage from the five floodings of the past year.

## SOUTHERN HIGH PLAINS

(Continued from page 4)

ply the information of his own fields was the type of preparation.

(2) Methods of wind-erosion control have been brought to a high state of proficiency in the past 15 years. The best combinations of methods fitted to the needs of different soils are well developed.

Our knowledge of land capabilities in the old Dust Bowl area is being applied to conservation planning in soil conservation districts. Safe land use is an indispensable first step to wind-erosion control. The best practices known will not keep low-capability land from blowing away under cultivation during the long dry spells which are natural to that climate.

An awful lot of dust control remains yet to be started in the arid margins of the Great Plains. The newness has barely been worn off 3 million acres of low-capability marginal zone land.

(3) In terms of land-productivity decline, more can be charged to erosion than to removals of plant food in the grain marketed from the first 30 years of cultivation on the High Plains. Fifty-bushel wheatland cultivated 30 years without effective wind-erosion control now has a 43-bushel ceiling. That was just found out in the last 2 years. It wasn't noticed by farmers because the loss of soil productivity was being more than offset during these 30 years by the efforts of the plant breeder and the advent of more efficient farming equipment.

What have we done to meet the High Plains fertility problem? Well, you might say we have just now found out about it, but we are getting squared away on some experiments. Give us a little time, if possible, before handing us over our next big problem, and I am confident we will come up with some sort of answer.

Before somebody asks me if we are going to have another Dust Bowl, I want to say, "Not in the same place."

## REVIEWS

**UNCLE SAM'S ACRES.** By Marion Clawson. 414 pp. Illustrated. 1951. New York: Dodd, Mead & Co. \$5.

The specialist in land management or others long familiar with public-land administration will find little in this book that is new. Nevertheless, this is a book that needed writing and the author has done a public service in drawing together much of the information necessary to an understanding of the development and administration of public-land policies in the United States.

The first three chapters discuss Uncle Sam as a landlord and trace the historical development of both the acquisition and disposal of public lands—from colonial days to the current controversy between the States and the Federal Government over the "tide lands." The next chapter describes the establishment of the great systems of reservations of public lands: reservations for Indians, the national parks, national forests, grazing districts, wildlife refuges, and others. This is followed by an account of the various land-purchase programs including the purchase of submarginal farm land, the acquisition of additional forest areas by purchase, the buying of land for national defense, and other uses.

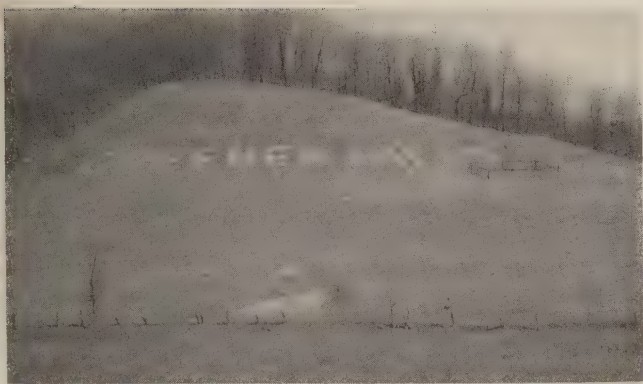
Chapter 6, on "What Our Federal Estate is Like," will perhaps be disappointing to many readers. The location of the public lands is indicated in some detail, with the familiar percentages of such lands in each of the Western States. Apparently, however, the very diversity of their physical conditions precluded more than vague generalizations about the climate, vegetation, or topography, certainly not enough to give much of an idea of what these lands are like in these respects. No mention is made of the *condition* of either forest or grazing lands, and their productivity is dismissed with statements of the cubic feet of timber or pounds of harvestable forage produced on the "average acre."

The discussion of the development of water resources is excellent, starting with our historical recognition of the importance of water for transportation, power, irrigation, the generation of electricity, flood control, and finally, the more recent efforts toward watershed or drainage-basin management. The struggles between such agencies as the Tennessee Valley Authority, the Bureau of Reclamation, and the Corps of Army Engineers for the control of such programs is discussed in unusually frank terms.

Concluding chapters describe the organization and functions of the numerous agencies that administer public lands, the uses of "Uncle Sam's Acres" by the public, and the policies and politics that influence their management.

—F. G. RENNER.

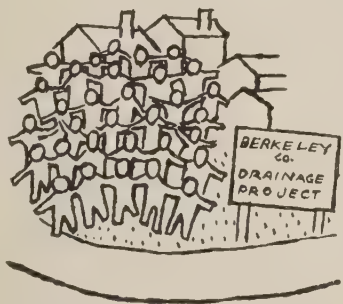




**UNIQUE ADVERTISING.**—To advertise a Wetzel County (W. Va.) program so named, the words "Greener Hills" are written on the slope of a pasture field of the Jennie Anderson farm at Knob Fork. The letters are 35 feet high and are here seen written with lime and fertilizer. Later "Greener Hills" showed up as dark green grass.

The work was done at the May meeting of the Wetzel County USDA council. Members present were Kathleen E. Stephenson, Dick Moore, Noel Cochran, Ralph Kittle, and Ted Starr. Also attending was I. E. Porterfield, assistant extension dairyman.

The First National Bank of New Martinsville sponsored the project.



#### **PMA FUNDS FOR GROUP DRAINAGE.**—

Thirty-three Negro farmers, led by the Reverend W. M. Worley, obtained 100 percent assignment of PMA payments for a community drainage project in the Berkeley County (S. C.) Soil Conservation District. The group raised a sufficient amount to cover the remainder of the cost, and the money has been placed in the bank, according to Work Unit Conservationist J. S. Livingston. The proposed work will not only greatly benefit the community agriculturally, but will also materially improve health and road conditions.

**SIMPLIFIED SOIL-MOISTURE COMPUTATION.**—In irrigation and soils work, the usual procedure for computing soil moisture involves two steps: (1) Subtraction of the net dry weight from the net wet weight, and (2) dividing of the resulting difference (water) by the dry weight. The quotient is the percentage of moisture on the dry-weight basis.

So many of the people I have met are using this two-step procedure that I am convinced this practice must be widespread. I hope the following description of our simplified procedure will be of as great value to others as it has been to us.

Our current procedure involves only one computation. We omit step number 1 and merely divide the net wet weight by the net dry weight and obtain the soil moisture percentage by disregarding the first digit of the result. When the first digit (usually the figure 1) is disregarded, the balance of the quotient is exactly the same as that obtained by first subtracting, and then dividing. We've substituted the dropping of the digit for the subtraction in the first step.

Let us consider a sample whose wet weight was 187 grams and dry weight 159 grams. The water content is equal to 187 minus 159, or 28 grams. The weight of the water divided by the dry weight is 28/159 or 17.61 percent. The wet weight of 187 grams divided by 159 grams dry weight is equal to 117.61 percent. By simply disregarding the first digit, we get 17.61 percent.

—STEPHEN J. MECH.

**"THANK YOU!"**—On April 15, when Hugh Bennett arrived at the age of three score and ten, cards arrived from all parts of the United States bearing greetings and good wishes from more than 5,000 persons. They came from warm personal friends and admirers, all of whom by the mere fact of being friends of the Chief are obviously ardent conservationists.

In the last issue, *SOIL CONSERVATION Magazine* announced that Dr. Bennett would continue at the head of the Soil Conservation Service another year. The importance of this year, because of the present emergency, was emphasized. As one means of helping to conserve Dr. Bennett's time and energies for the urgent public tasks of the moment, this periodical now undertakes to transmit to these thousands of well-wishers the heartfelt appreciation of the Chief. He would very much like to acknowledge each greeting individually, but that is out of the question just now. He is anxious, however, for everyone who sent a card or other greeting to accept his thanks for adding pleasure to an eventful occasion, *and also for helping pile up the evidence of widespread concern for the future of our American land.*



**PROGRESS IN GRASSLAND FARMING.**—One of the greatest things accomplished by the Holmes County Soil Conservation District has been to divert eroding hill land from row crops to grassland farming, according to Lute Ellison district farmer and manager of the livestock sales barn in Lexington, Miss. "This trend," Mr. Ellison told the Lexington Rotary Club recently, "is not only slowing down erosion, but is also helping materially to improve the economic conditions of our county. More than \$2,000,000 worth of livestock passed through the local sales barn during 1950, and 60 percent of it was produced in Holmes County."

**111 SUBSCRIPTIONS.**—Through the enterprise of five Salem County, N. J., farm-machinery dealers, 72 farmers, most of them in the South Jersey Soil Conservation District, have received 1-year paid subscriptions to SOIL CONSERVATION Magazine.

In sending this publication to these farmers as an aid in their conservation operations or as a spur to start conservation farming, the five farm-machinery dealers have shot the paid subscription total in Salem County to at least 111. Previously, the First National Bank of Elmer had sponsored subscription renewals to 29 district farmers and entered new subscriptions for 10 others. The machinery dealers are in the National Retail Farm Equipment Association, which is sparking a campaign in support of districts. They are the Owen Supply Co. of Woodstown, Pearson Supply Co. of Salem, Rudy Franzen of Monroeville, M. E. Foster of Elmer, and Leslie G. Fogg of Bridgeton. Roy Ballard, SCS work unit leader at Salem, handled the transaction in cooperation with the dealers.

**MENDED THE RIPS.**—Clarence Holcomb paid \$25 per acre for a worn-out, gullied hillside farm near Pittsburg, Tex. His neighbors thought he was buying 110 acres of trouble. The farm wouldn't support a cow on 10 acres. The gullies were deep enough to hide a team of horses.

But in the spring of 1950, 10 acres of the hillside which was the worst gullied supported all his cattle most of the time over a 60-day period.

Holcomb is a supervisor of the Sulphur-Cypress Soil Conservation District. He is in a group of 16 neighbors who practice soil conservation with him. He has received two plaques in the Fort Worth Press "Save the Soil and Save Texas" awards program. The plaques are in recognition of his reclamation of a worn-out farm.

—TED CALVERT.

*Note.—The essay below is one of 400 essays entered in a contest conducted in elementary and high schools by the Cheatham County (Tenn.) Soil Conservation District.*

## What Soil Conservation Means to Me

**By Barbara Eleanor Langston, Age 12,  
Grade 7, Kingston Springs, Tenn., School**

First, and of greatest importance, soil conservation means life to me. Every plant and animal takes things from the soil and then dies and returns the things which it has taken from the earth back into the soil. From the soil we get our food without which we would not be able to live. Soil produces plants which we eat to produce blood, bone, and skin. We get our food, clothing, and shelter by means of soil production. We must conserve our soil and turn it into a wise use. Our land and the way we use it may determine our future happiness. Therefore, soil conservation is important to me and everyone else in order to live on this earth. Soil is indeed our most important natural resource. If soil is misused it produces less and less.

Soil also means prosperity to me. It is my best friend and must be saved. When it is rich we have plenty of food. When it is poor, we are poor. No one likes to be poor. So we must learn to take care of our soil and treat it properly. We must learn to love our good earth.

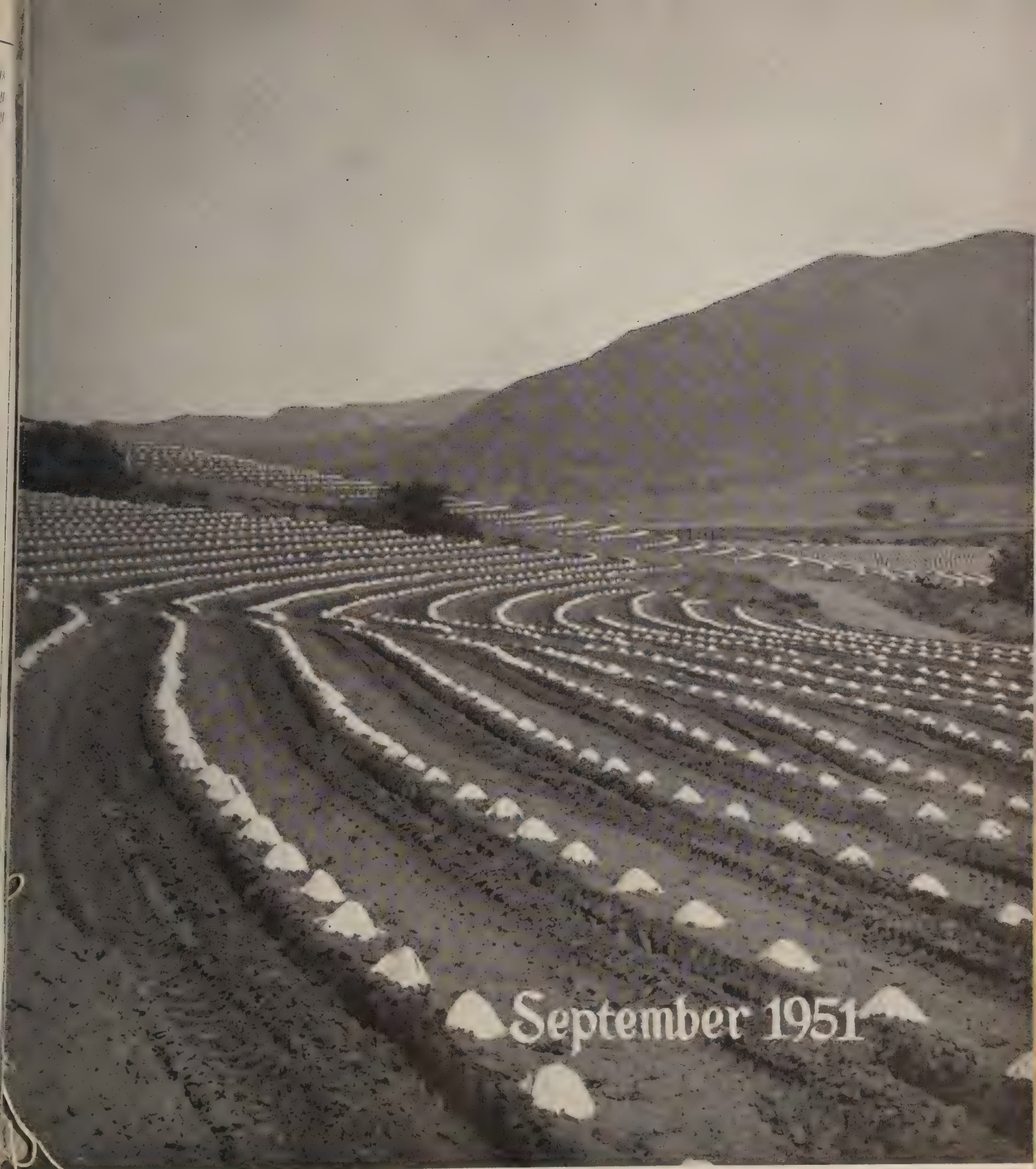
We must conserve and protect our soil and not abuse our privilege of having a wonderful, prosperous, and peace-loving country for which our forefathers fought and died.

I can help plant trees, grass, and plants on worn spots of soil and help conserve and beautify it. I can help control soil erosion by stopping gullies and by building small dams. This is lots of fun too. I can also help conserve soil by helping to prevent forest fires. A forest fire can greatly injure the soil. Fire destroys growth, leaves, and waste which otherwise would be used for conserving and enriching the soil.

To me, conserving soil means living a full, healthy, and profitable life which otherwise we would not be able to enjoy.

**UP THEY WENT!**—A farmer in the Dry Creek (Idaho) Soil Conservation District was asked if operation of the district has increased his taxes. "Yes, it has," he replied. "My income taxes."





September 1951

# Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

# SOIL CONSERVATION •

**CHARLES F. BRANNAN**  
SECRETARY OF AGRICULTURE

**HUGH H. BENNETT**  
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE  
WASHINGTON, D. C.

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## WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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## SPORTSMEN AND FARMERS WORK TOGETHER.

—In the Texas woodlands near Palestine and Crockett, the Anderson-Houston Soil Conservation District is working hard at a wildlife program aimed at better hunting, improved soil conditions, and closer hunter-farmer relationships.

The project won first place over strong competition from a half dozen other districts in the wildlife conservation division of the *Fort Worth Press* "Save the Soil and Save Texas" 1951 awards program. To the district went a beautifully engraved bronze plaque, about dinner-plate size, given by the Wildlife Management Institute.

The district program has resulted in cooperative agreements with landowners planning more than 7,000 acres for wildlife

(Continued on page 46)



**FRONT COVER.**—Early tomatoes are planted under hot caps in the Middle San Luis Rey Soil Conservation District, Calif. The field shown on the cover is part of the 3,000 acres of contoured truck crops grown in this district, 1,800 of which are in tomatoes. The sloping hillside seen here is typical of the frost-free land on which San Diego farmers can produce off-season crops. The photograph was made by Robert B. Branstead.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



# A MAIL CARRIER WHO DELIVERS THE CONSERVATION MESSAGE



George Bennett delivers mail and also asks farmer Oscar Lovdal about his conservation practices.

By **GREGORY G. CURTIS**

**F**OR some 30 years George S. Bennett has been carrying Uncle Sam's mail over Southbury rural route 2, in New Haven County, Conn. Three hundred families depend on him, 6 days a week, for prompt and safe delivery of letters, parcels, and papers.

In the tradition of the postal service, George Bennett has faithfully carried on his job in a spirit that has built close relationships along the 31.2 miles of his route. Out of the respect and con-

fidence so created, he has developed his pet hobby—conservation of soil, water, woods, and wildlife—with outstanding success during the past decade.

Largely through Bennett's spare-time activities, on a personal basis as well as through facilities of the Woodbury Rod and Gun Club, Inc., in which he is "Mr. Conservation," 315 club members and hundreds of others are really doing something to protect natural resources on 51,000 rural acres. As a result—

25 farmers have been interested in operating under complete conservation farm plans.

54,000 tree seedlings, shrubs, and cuttings have been planted for wildlife feed and cover.

Note.—The author is work unit conservationist, Soil Conservation Service, New Haven, Conn.

Experimental work has been started with nuts, shrubs, and other plantings never before grown in the area.

More than 100 feeding stations and feed hoppers, and 4 duck nest boxes, have been built and placed, and many feed patches ranging from one-eighth to three-fourths acre have been established.

200 pheasants have been raised in the club's holding pens, and with 300 more have been released each year in the woods by the State Board of Fisheries and Game.

3,000 fish, obtained annually from the same State source, have been planted in streams.

Stream pollution has been vigorously fought.

A scholarship has been awarded annually to the Conservation Workshop, University of Connecticut.

Through participation in this program in 1950, 160 different persons in the Woodbury-Southbury area were active in advancing conservation.

In appreciation of all this, and more, the Woodbury Rod and Gun Club at the 1950 annual dinner of the State Natural Resources Council received, by unanimous vote, the Connecticut Outdoor Writers' "Guardian of Natural Resources" award as "the group that contributed most to our soil, water, and forest resources."

George Bennett sparks these things, and leads others into helping him get the jobs done, for more reasons than that he, personally, likes to hunt and fish. Principally, he does a tremendous amount of this work merely because he likes to do it. He also appreciates the values that fertile soil, plenty of pure water, healthy woods, and abundant wildlife contribute to good living and to the future of the country. He also wants to help landowners who permit hunters, fishermen, and outdoor enthusiasts to go on their land.

In a continuous program now entering its eleventh year under Bennett's leadership, his deep and moving concern for the area's natural resources is found in the club's intelligent and successful approach to wildlife conservation. The club's conservation committee assists nature by functioning on a "put and take" basis. It exchanges feed, shelter, and sanctuary needed by birds, animals, and fish for expanded hunting opportunities. Wildlife flourishes; there is no depletion problem.

"Mr. Conservation" has convinced fellow members that it is wise to use some of the club's funds to improve shelter and feed facilities for wildlife. With unanimous backing, he has drawn on game, tree, and shrub planting stock at the State Board of Fisheries and Game, at nurseries of the Soil Conservation Service, and other sources.

When the available free supply of plantings has been insufficient, the club has voted funds for purchases. In some instances, landowners have been interested in paying for unusual and hard-to-get shrubs, nuts, and seedlings, such as Korean nut pine, the thornless honeylocust, Chinese chestnuts, and pinyon nuts. Donations from outside friends have helped the club carry on this work.

Right now George is trying out the buffaloberry to determine if it will fit into Connecticut's wildlife program. Sometimes such experiments are unsuccessful, but confidence in his leadership is such that it brings the voting of club funds for the work.

Heading up all conservation work for the Woodbury club is a personal responsibility that George Bennett takes seriously. With great care the committee finds landowners interested in making plantings, obtains and delivers supplies to them, and checks first on plantings and then on year-to-year growth.

George spreads the supply thinly, giving as few as one and very seldom more than 100 plantings to any individual. And when he finds, in his regular inspections, that plantings are not made or cared for, he is reluctant to allot more stock to the same person. When plantings fail for natural reasons, replacements are made.

George teaches his fellow conservationists to graft flowering crab cuttings on wild apple seedlings, and how to build feed hoppers and establish feeding stations and patches. Last fall he coaxed 50 people into working on, and making donations to, the club exhibit at the Pomperaug grange fair.

The systematic way in which he moves through his off-hours job and keeps closely detailed records of what, how, when, and where everything is done is found in the steps he took to get the conservation story before local farmers.

In three meetings held by groups of farmers at the Bennett home, Charles N. Hammarlund, Jr., SCS technician, told the story of the New Haven County Soil Conservation District and how it is set up to help farmers fight erosion, understand the capabilities of their land, and make the best use of



each acre without impairing productiveness. Applications for 25 complete farm plans came out of these meetings. Now, more conferences are in the making which presumably will lead still other farmers to ask for conservation planning.

George started life on a Southbury farm. He left home in his teens, when he got a chance to be chauffeur for a New York family summering in Connecticut. Tiring of big-town life, heavy demands on his time, and long trips away from home after he married, he returned to Connecticut during World War I and worked in defense plants until the end of the emergency. While his family was growing and work was not steady, before he became a rural mail carrier in 1921, George bought a gun and began hunting during free hours to help supply the family table.

It was in these years that he noted more and more hunters from other parts of the State. This, he found, was because game populations in their home areas had been depleted by pressure of too many hunters. It seemed likely that the same sort of thing would happen in Woodbury and Southbury if protective action were not taken. So he began to read and study conservation, with accent on wildlife.

Out of it, in 1935, came his membership in the club which is now 30 years old. In 1941 the club started its first conservation program with one item, the planting of 2,000 red pine seedlings. That's all that was done that year, but ever since, there has been a sharp annual step-up in application. In 1950 the club—

Planted 1,000 hemlock, 2,000 multiflora rose, 50 Korean nut pines, 1,000 Norway spruce, 1,000 white pine, 1,000 red pine, 250 basket willow, 200 highbush honeysuckle, 202 Chinese chestnuts, 500 Siberian flowering crabs, 730 Amur privet, 500 autumn *Elaeagnus*, and 12 thornless honeylocust.

Established 6 feed patches of buckwheat and lespedeza.

Encouraged 80 people to plant pinyon nuts on an experimental basis, and 3 men to graft *Florabunda* flowering crabs on 45 wild apple seedlings.

Sponsored a scholarship at the Conservation Workshop, University of Connecticut.

Introduced 25 farm families to the New Haven County Soil Conservation District and the Soil Conservation Service for technical advice on their conservation problems.

Won the Connecticut Outdoor Writers' "Guardian of Natural Resources" award, and received honorable mention in the annual conservation project award at the Fourteenth National Sportsmen's Show in New York City.

At their own home, Mr. and Mrs. Bennett practice all that he preaches to his multitude of friends along route 2. They provide a wide variety of feed and shelter for wildlife, have a small pond, and are preparing to build another in combination with a trout pool.

Last year, when an SCS technician had no place to plant two dozen Chinese chestnuts that were a problem because the roots were severely damaged by mice, George volunteered to take the lot. He cleaned them, nursed them along, planted them in his nursery, and has 20 of them flourishing.

George has planted many types of trees and shrubs in his yard because he believes it is good conservation to do so—an auxiliary to plantings in field and woods—and because it will let others become acquainted with different trees and shrubs. Songbirds, pheasants, squirrels, and rabbits make themselves at home at his very doorstep.

George has won the support of many influential people who live roundabout, among them being Gladys Taber who often writes about George in her monthly column in the *Ladies Home Journal*.

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**LUPINE BOOSTS YIELDS.**—E. H. Thomas, district supervisor for the Flint River Soil Conservation District, Mitchell County, Ga., says that blue lupine has become a "must" for farmers in his county. One of his neighbors, Glenn West, more than doubled his corn yield last year and increased his peanut yield from 700 to 1,200 pounds. Another neighbor, David Harrell, who couldn't grow oats after continuous peanuts, produced 55 bushels of oats to the acre after turning under two crops of lupine. Lupine also greatly increases the growth of Bermuda-grass pasture. James Davis planted lupine on a 14-acre Bermuda pasture and grazed 25 cows on the area from June until October.

---

**WATER EXPERT.**—Homer Wells, who has been with the Soil Conservation Service for 7 years, retired June 30. He is one of the world's leading hydrologists and knows the hydrologic characteristics of this country as do few others. He has agreed, after a few months' rest, to help the Service on special jobs from time to time as a consultant.

# GOOD LAND USE MAY MEAN GROWING BAIT

By JIMMIE P. MAXWELL

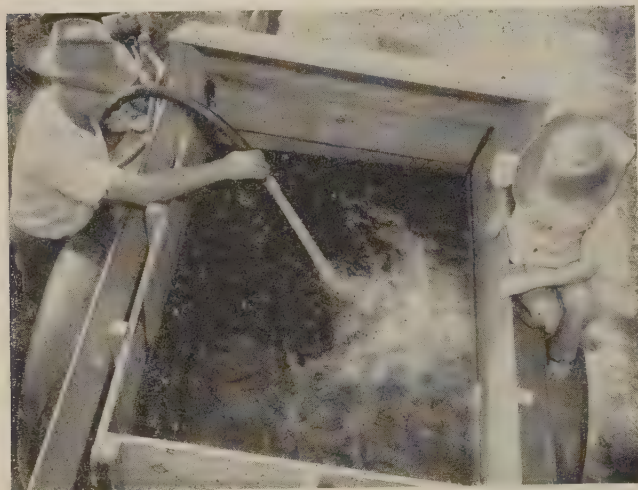
**W**ILLIAM A. DRIGGERS, known by his friends as "Mr. William," is the minnow king of northwest Louisiana. He has a 150-acre farm near Saline. His land was poor for ordinary crops—eroded, depleted, a poor prospect as a family farm.

The one resource he had in abundance was water—good water that surged from a number of underground springs. The water was going to waste—running away. Why, he asked, should he not rest the cropland for a while and put the water to work?

I suggested something like this to Driggers in discussing his conservation program. Such a course would ease the pressure on the weakened soil and give Driggers a better chance to treat his cropland according to its needs.

Minnow production would be both safe and profitable, we felt. Such an enterprise would be in keeping, too, with the fundamental principle of using the land according to its capabilities and treating it according to its needs. I also pointed out that in addition to technical assistance on other parts of his coordinated program, he would receive help from the Soil Conservation Service in the proper

Note.—The author is work unit conservationist, Soil Conservation Service, Jennings, La.



Olen Brewton fills tank in his pick-up truck with water for 800 minnows he is buying from William Driggers for his fisherman's place at Saline Lake.

techniques of land preparation and minnow-pond management.

When Driggers dug his first minnow pond, he started a trend. There were others in the same locality with lots of spring water that was going to waste. They, too, started digging minnow ponds. And today they have a thriving business—minnows by the millions! From them they are making either a good living or a handsome secondary income. The farmers work together, exchange ideas. But Mr. William is the recognized oracle, the consultant, the man who pioneered.

Records show that the little fish are paying big dividends. Driggers launched his minnow business in 1948 with 2 ponds embracing only a tenth of an acre. His crop that year totaled 20,000 minnows. From that beginning he enlarged his operation to 20 ponds covering more than 3½ acres.

The 400,000 minnows from Driggers' 1950 crop grossed him about \$4,000. Most of them he sells at wholesale to large-scale bait dealers. "One minnow, one penny" is his charge.

He realizes additional pocket money from sales to the numerous Izaak Waltons of northwest Louisiana who drop by his minnow farm for a "mess of Leapin' Lenas, Mr. William." The Leapin' Lenas, as the golden shiners are called locally, cost the anglers 2 cents each when purchased thus at retail.

Mr. William and his family depend now on minnows supplemented by cash from selective cuttings of the native pines which cover much of his farm.

"I'd say \$4,000 a year off 3½ acres is common-sense conservation," remarked a neighbor. Few there are who would disagree.

Like Driggers, other farmers of the area who took to raising minnows belong to the Saline Soil Conservation District. They all receive technical help from the Soil Conservation Service.

Clarence Knotts, whose 490 acres adjoin the Driggers property, is one of them. He operates a successful pole and piling business. But by using underground water, and relying on assistance from his experienced neighbor, Knotts developed 16 minnow ponds, and last year he marketed 300,000 golden shiners from them. He's now expanding his





William (right) and his brother Albert seine pond on Driggers farm.

unique operation to 2,000,000 minnows annually.

Knotts will testify that the minnow business amounts to more than just sitting back and waiting for them to multiply. A heavy rain in the spring of 1950 washed nearly 100,000 minnows out the spillway from one of his larger ponds. Knotts estimated his loss at close to \$1,000.

The farm pond on Ray Huckaby's place near Bienville, La., is well stocked with fish. But many times Huckaby made the 40-mile round trip from his farm to Driggers' for a bucket of minnows that he might fish in his own pond.

The trips meant lost time and money. So last February Huckaby made one more trip to Mr. William's minnow farm. This time he bought shiners to stock three minnow ponds he had constructed on his own farm. "I may go commercial," Huckaby says. "This minnow business looks good to me." He already has laid out three additional ponds.

Other minnow raisers in the Saline Soil Conservation District are Americus Rhodes, his brother, J. W. Rhodes, and D. B. Caldwell.

Interest in the bait business has been increasing. Supply and demand indicate this is perhaps an opportune time for launching a minnow venture. The fisherman's seine won't dip as many minnows from a Louisiana river now as it would several years ago. Some States forbid seining creeks and rivers.

The tyro minnow farmer, though, is due for some surprises. He'll learn, for example, that a good minnow pond, like a good pasture, requires proper

fertilization. He'll find that slaked lime applications are needed to clear badly muddied ponds.

He'll see that well-fertilized ponds will produce about 300 pounds of minnows per surface acre, and he'll discover, too, that the surface area of his pond is what counts—a farmer can grow about as many minnows in a 1-acre pond 3 feet deep as he can in a 1-acre pond 30 feet deep.

The minnow beginner will find that what the little fish eat is important. SCS biologists say 1 pound of vegetable food to 2 pounds of animal food is an ideal balance for winter feeding. Little feeding is necessary in summer; proper fertilization will produce enough plant food during the warm months.

There must be protection from preying snakes, frogs, and coons. Gophers will demand attention, too; their burrowing has drained many a minnow pond.

More important, though, the novice can discover that proper use of soil and water conservation knowledge will enable a man to take a decent living from less than 5 acres of farm land.

**FESCUE POPULARITY GROWS.** — Increasing popularity of tall fescue is indicated in a report from Tennessee on the 1950 "Keep Tennessee Green" program, sponsored by the Tennessee extension service. Seed dealers' reports show that 1,945,420 pounds of tall fescue seed were sold to farmers as compared with 2,052,420 pounds of orchardgrass seed, a favorite of many years' standing.

# DISTRICT PROFILE

FRANK B. LINN  
of  
ALASKA



Frank B. Linn.

In a farming land where a soil auger will bring up frost in July and where herds of moose walk over fences in the winter, Frank B. Linn, of Alaska, is giving strong leadership to the cause of conservation.

Frank Linn came to Alaska in 1927 from Manhattan, Kans. He worked for 3 years as a dairyman on the Matanuska Experiment Station and three more years as superintendent of the Fairbanks Experiment Station. He then tried mining for a couple of years, which shows that Linn is a normal Alaskan in all respects.

Two years cured Frank of the mining fever and sent him back to the farm. This time it was farming for himself in the Matanuska Valley near Palmer. This was shortly after the colony was established.

Frank took over two 40-acre farms when they were abandoned by colonists, and has since added another 80 acres to make a quarter section, which he devotes to dairying.

Farm development in Alaska is a slow process. Every acre must be cleared of timber. Since 1935 Frank has cleared 70 acres and put them in crops. Twenty acres suitable for rotated crops still remain to be cleared. Linn plans to keep the rest of his farm in pasture and a wood lot for firewood and fence posts.

A dairy herd of 20 milkers was built up as land was cleared. By careful culling, it has been improved to a good cross between Holsteins and Guernseys, with Holstein predominating. In recent years, as Red Dane bulls and artificial insemination came to the Valley, Frank Linn, with other Alaska farmers, has been working toward a Holstein-Dane cross that looks very good. This is a cooperative enterprise between Alaska farmers and the Agricultural Research Administration.

Frank was the first Matanuska Valley farmer to apply the principles of rotation grazing of pastures.

He has three partners: his wife Vera; his son Allan, a senior at the Washington State College; and his daughter Mary Ann, now a freshman at Washington State. Mrs. Linn has a full-time status. Besides driving trucks and tractors and tending 300 chickens, she somehow finds time to serve on the school board and keep up on scientific developments in farming.

Frank has been active in community service for many years. He served for some time as a member of the board of directors of the Matanuska Valley Farmers Cooperative Association and on the advisory committee for Farmers Home Administration.

On the creation of the Alaska Soil Conservation District in 1947, Linn was appointed to the Alaska Soil Conservation Board and has been chairman of that body ever since. Under his leadership, sub-districts have been created in most of the more promising agricultural areas of the Territory.

Many promising areas of Alaska are in the development stage, but much of the Territory is an unknown quantity insofar as agriculture is concerned. One of the first objectives of the Alaska Soil Conservation District is a physical land inventory of all accessible areas, as a basis for guiding settlement. Frank and the other members of the conservation board strongly believe that this agricultural land inventory should be kept ahead of settlement and that unsuitable land should not be made available for agricultural settlement.

The inventory will be useful also to road-building agencies in planning new highways and access roads.

Frank is a firm believer in the agricultural future of Alaska. The other members of the board, Virgil Eckert of Palmer and Bert Stimple of Fairbanks, share his views. Under Frank Linn's leadership, the Alaska Soil Conservation Board is mak-



ing sound progress with conservation farming. It is hoped, by sound planning and preventive measures during development, to avoid having to undertake costly corrective measures in years to come.

—CHARLES W. WILSON.

## DISTRICT PROFILE

ORRELL  
of  
ARKANSAS

Archie Orrell is one of those farmers who look on grass as agriculture's most important crop.

"It brought me out of the depression," he avers.

In 1932 Orrell and his wife had only \$35. Their uphill climb, a story chiefly of hard work, had its beginning when they put down that amount as a first payment on nine dairy cows.

Three years later they had built up the herd to 20 cows and moved into their present home near Hot Springs.

"The place wasn't much to look at," this Arkansas farmer recalls. "The buildings were in as bad shape as the land, which was the most run-down piece of dirt in the whole countryside. That's when I began with grass."

Orrell first put 75 of his 140 acres in Bermuda-grass.

"That cut down erosion and gave good summer grazing," he says. "Then I got interested in cool-season pasture."

One of the first cooperators with the Lake Hamilton Soil Conservation District, Orrell got good help from SCS technicians. He entered on tall fescue grass, Ladino clover, and crimson clover, and soon he was on the way to a year-round grazing program.

"One of these days I expect to have this whole place in grass and legumes," he said then.

It was no idle chatter. Orrell has continued to move forward. He has added clover and more grass, until now the entire farm is covered with the exception of 5 acres left in trees. And even that supports a good growth of Bermuda.

Orrell has always taken time to help other people with conservation. He has been a supervisor of his district since its organization in 1941.

Success hasn't erased the memories of the early days. "That was when every nickel really count-



Archie L. Orrell.

ed," he says. "The money we got for milk products each day was spent for feed to use that night and the next morning. One day, on the way home from town, I lost a sack of feed from my truck and almost had to close up because I had nothing to feed the cattle the next morning."

During those first years on the farm the Orrells tore down the dilapidated structures and began building a home.

"As soon as it was nearly enough completed to keep us dry, we moved in," Archie recalls. "It was 2 or 3 years later before the house was actually finished. And even then, it had no conveniences."

The house now is a modern cottage-type building, heated with butane gas and fully equipped with electrical conveniences.

"I think we've got about everything now you could find in any modern home in the city," Orrell says.

After 15 years of dairying, he switched to beef.

"I thought it might mean a better living for my family," he explained. And so it has.

Including calves, he now has 85 head of cattle. His "creep feeder," a fenced-in trough with openings only large enough to admit calves up to a certain size, has proved a money maker. Orrell's calves, born early in the spring, are fattened during the off season and sold the following spring for top prices.

He estimates it costs about \$7 per 100 pounds to fatten calves through the "creeper" system. They

usually weigh about 500 pounds when sold to a Hot Springs slaughterhouse.

Mr. and Mrs. Orrell have two daughters. Despite family and district demands on his time, Orrell is active in the Garland County Farm Bureau, the Walnut Ridge Masonic Lodge, the Antioch Baptist Church, the Garland County school board, and the Parent-Teacher Association.

—DEWEY S. THOMASON, SR.

## EVERY VO-AG BOY A CONSERVATION FARMER

By ROY BALLARD

**C**HAMPION C. COLES, vocational agriculture teacher at the Salem (N. J.) High School, had a deep interest in soil and water conservation even before Salem County was included in the

NOTE.—When he wrote this article the author was Salem County work unit leader for Soil Conservation Service, working with the South Jersey Soil Conservation District, Salem, N. J.

South Jersey Soil Conservation District. And he was delighted, on returning from military service, to find an active work unit on the job. He decided to do what he could to train every one of his vocational agriculture boys to be a conservation farmer.



Soils group in vo-ag class, with Coles and Ballard, first examines enlarged land-use map of Lockman farm in Quinton Township. The map was prepared by Paul Lockman as a class assignment.





At the Lockman farm. Coles, left; Ballard, right. Others: George Schrier, Warren Master, Paul Lockman, Clifton Burkentine, Ben Haynes, Robert Stoms.

Coles labored unceasingly for the development of his idea and now has a program of which he justly can be proud, one that is worthy of emulation by other vocational agriculture teachers and work unit leaders.

The Coles program did not come overnight. It was the result of hard work. From a modest beginning, he proceeded step by step.

The first year, a few conservation films were shown to the boys. Next year, arrangements were made for field trips so the boys could actually see conservation measures in the field. The third year, the class members were given an opportunity to assist in the establishment of conservation measures on cooperators' farms. Now, they have come to a place where they cooperate in preparing a complete conservation program on each of their home farms.

For a more detailed picture of the training program, let us look at the set-up this last year. The preparation of a complete conservation plan on the home farm of each of the boys was made the basis for the teaching in Coles' entire agriculture depart-

ment. The program was started with the sophomore class, which was composed of the following boys: Clifton Burkentine, Russell Fithian, Ben Haynes, Paul Lockman, William Loper, Warren Master, Bill McGowan, James Osborn, Shirley Powers, George Schrier, Robert Stoms, and William Willis. Special emphasis was on soils instruction. The dairy training of the junior year was dovetailed into the program, and the final summation was made with the farm-management work of the senior year.

To assist in the development of the project, various aids were made available through the cooperation of the Salem County work unit. Twenty-five conservation films were scheduled for showing. A general erosion map of the United States was supplied to each boy. In addition, a copy of each of the following Soil Conservation Service publications was added to each boy's library: *Youth Can Help Conserve These Resources, Soil, Water, Forests, Wildlife*; *Technical Skill for Soil and Water Conservation*; *Teamwork to Save Soil and Increase Production*; *Conquest of the Land Through Seven*



*Thousand Years; The Future of Our American Land; Use of Woods That Are Commonly Wasted; Use the Land and Save the Soil; Taming Run-away Waters; and Dust Storms Come from the Poorer Lands.*

Two field trips were arranged for the sophomore class as a unit. On the first trip the class visited the farms of two cooperators whose principal problem was erosion control. On the Leland Warner farm in Mannington Township, was observed a conservation program started 5 years ago with the following conservation measures now established: contour strip cropping, contour planting, crop rotations, cover cropping, vegetated waterways, diversion terraces, and reforestation. On the farm operated by Kelly Brothers in Pilesgrove Township, the boys saw a conservation plan that had been in operation for 2 years. There they made a study of the LUC map and learned why the Kelly boys had established such conservation practices as contour strip cropping, contour planting, crop rotations, cover cropping, vegetated waterways, diversions and outlets, and retirement to perennial hay of certain critical areas.

On the second field trip the boys visited two farms in Lower Alloways Creek Township recently purchased by Philip Gibson, where the difficulty was lack of proper drainage. There they had opportunity to see a conservation program in its initial stages. To correct poor drainage, an elaborate system of slightly over 5 miles of open field drains was planned. Arrangements were made for the boys to watch developments.

The boys were given an opportunity to display their initiative by preparing an enlarged LUC map of their home farms to be used for group discussion and study. Some of the lads enlisted their fathers in the program. As a result, conservation plans are being prepared on the farms owned or operated by the parents of Russell Fithian, Ben Haynes, Paul Lockman, William Loper, George Schrier, and Robert Stoms.

After carefully scrutinizing the LUC maps and becoming familiar with the information and problems of individual farms as shown by them, the group moves to the farms, where down-to-earth planning and establishment of program begins. With completion of such field work as surveying, selection of rotations, and arrangement of fields, the group returns to the classroom to make designs and add finishing touches to the conservation plan.

Close contact with parents is maintained. When a plan is completed, a boy assumes the responsibility of getting his parents' signatures.

By cooperating with parents, teacher, and work unit leader, the boys gain a sense of a task followed through to completion, and also learn valuable experience in working together for a better community.

Coles' influence has permeated other departments so that Salem High School is unique in its appreciation of soil and water conservation. During the last year, he was instrumental in having a number of conservation films shown to the general science classes taught by Anne R. Palumbo and Charles B. Lutz; biology classes taught by Evelyn C. Magsam and Anne P. O'Donnell; home economics classes taught by Anne Sickler, Eleanor Dickinson, Katherine Lawrence and Stephanie Mulford; a world history class taught by Edwin Bacon; and the Problems in American Democracy class taught by Lillian S. Ackley. A field trip was made by 150 pupils in Bacon's world history classes to view conservation work in the Salem County work unit.

The importance of Coles' work caused him to gain recognition in a much wider field and lead O. E. Kaiser, State Supervisor of Agricultural Education in New Jersey, to select him as the vocational agriculture teacher to represent New Jersey on a panel discussion in Philadelphia on "How May Vocational Agriculture Help to Develop a Conservation Program?"

Having lived to see his hopes accomplished, Coles is not content to stop there but even now, with vast enthusiasm, is making plans for a brighter future for his vocational agriculture boys. For example, realizing the importance of keeping abreast of current developments, he is advocating that his boys become regular readers of SOIL CONSERVATION Magazine and is encouraging those who are able to subscribe to it.

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**DISTRICT BRINGS PROGRESS.**—"Phenomenal progress" that has been made in agriculture in Seminole County, Ga., during the past 10 years is attributed to assistance of the Soil Conservation Service through the Flint River Soil Conservation District by Ed Kelly, Hereford breeder and district supervisor of Donaldsonville, Ga. Kelly cites farm planning, terracing, introduction of new grasses and legumes for pasture development and their proper fertilization and maintenance, and especially drainage of areas that previously were of no value to the farmers or the community.





C. O. Buford, church pastor, supervising Troop 10.

# CONSERVATION CLINIC FOR SCOUTS

By LEON J. McDONALD

**P**LANTING, seeding, and fencing ten 2-acre wildlife plots in one-half day was the outstanding accomplishment of 100 Boy Scouts during Oklahoma's first "Soil Conservation Clinic for Scouts," held near Shawnee, Okla.

Plans for the clinic did not happen over night. Credit for the idea goes to Roland Lee, work unit conservationist of the SCS at Shawnee. About a year ago, Lee, working with district supervisors and officials of the city of Shawnee, developed a conservation plan for controlling erosion on the land within the watershed of Shawnee Lake, the city's water supply. Application of the treatment planned in cooperative agreement between the city and the Shawnee Soil Conservation District had made remarkable progress. Eroded areas had been planted to grass, diversions had been constructed, gullies had been plugged and sloped, small dams had been built, and other practices had been applied to the watershed to hold the soil in place and prevent the lake filling with silt.

Note.—The author is assistant State conservationist, Soil Conservation Service, Oklahoma City, Okla.

Experience as a Scout enabled Lee to see that the wildlife phase of the over-all plan presented an excellent opportunity to use Boy Scouts productively and at the same time give them valuable training and experience. Of course the city could hire men to do the work; but Scouts would miss the needed training. Lee discussed his idea with Paul Silvey, district chairman, and Buddy Baptist, area director, Boy Scouts of America. They were pleased with the idea.

Representatives of State and Federal agencies were consulted. District supervisors grasped this opportunity for "Greater Service" and from all parts of the district, people showed a willingness to cooperate.

Members of 14 troops, representing every section of the county, participated. Troop sponsors included churches, schools, parent-teacher associations, American Legion posts, and civic clubs. Most of the boys camped in the lake area the night before "Operations Wildlife." Early Saturday morning, March 31, the Scouts, together with their scoutmasters and technical supervisors, assembled by troops to receive instructions from Roland Lee. Buses, trucks, and pick-ups took the boys to the 10 wildlife plot areas. These plots were located approximately one-half mile apart on the watershed.

On seedbeds already prepared with district and city equipment, the Scouts planted bicolor lespedeza, indigo, Russian-olive, pine, and cedar. These trees and shrubs were planted in contour rows. Some Scouts dug holes, others placed the plants in the holes, and a follow-up crew placed the soil around the roots and packed it gently. Switch

cane, sericea and Korean lespedeza seed were sown in all of the plots to provide feed and cover. Under expert supervision, Scouts fenced each area after planting and seeding operations had been completed. By noon the job had been finished.

During the afternoon, Scouts and leaders participated in boat rides, treasure hunts, and explorations and observed bird dogs perform during a quail hunt. The afternoon program was unusually interesting and informative.

That evening, in the light of a huge campfire, before a crowd estimated at 2,000, each troop put on a 5-minute skit. Roland Lee explained the significance of the day's activities, and visiting dignitaries lauded Scouts and their co-workers for a job well done.

Scores of Boy Scouts returned home with a better understanding of what it meant for the land, too, to "Be Prepared."

# THE BUSINESSMAN'S STAKE IN SOIL CONSERVATION

By A. E. HUNTSINGER

Chairman, Agricultural Committee, New Mexico Banker's Association

**I** AM glad to have a part in the furthering of soil conservation.

I have spent 38 years in banking and during those years I have seen many changes and some very difficult periods, an unprecedented depression and two world wars.

As individuals, we have little control over either depression or war. What we can do is to work for sound government and urge in our community that development of better living conditions for all the people—which, in turn, will develop better citizens.

While the United States during the past 100 years has developed the greatest and most efficient industrial system in the world, we have at the same time been engaged in using up or destroying our natural resources at a faster rate than any other nation has ever done.

Research, energy, and inventive genius have been responsible for our rapid industrial development, while leaving to Federal and State Government the entire research program supporting our agricultural plant.

Will our industrial system continue to develop when our natural resources are gone? It must not be overlooked that some of our natural resources are not renewable and that when they are exhausted, we must look for substitutes or import the raw materials. No other nation originally had the great supply of available natural resources as the United States once possessed.

We had oil, gas, coal, iron, copper, salt, sulphur, and many other nonrenewable natural resources. We had our vast forests, the finest in the world; our great river systems, fed by a bounteous rainfall; and we had a fine underground water supply which gave us artesian flowing wells in many parts of the Nation. Our wildlife and fish were in such abundance that we felt they could never be exhausted; and we had the finest soil in the world, adapted to a highly varied agriculture.

What have we done to these resources? We recklessly harvested our forests without thought of providing for reforestation of the cut-over lands that would have continued to produce wood for us as long as people inhabit the earth. We could easily have practiced good forest management from the very beginning.

Check the situation in your own State and see what destructive methods have done to your timber. Many of your large lumber companies have cut out and moved out, and you have nothing to show for the great virgin forests that formerly clothed these lands.

We impoverished or ruined much of our finest agricultural and pasture land by poor farming methods and overgrazing. We mined the soil without regard to replacing any of the elements that were taken out by crops and by grazing or allowed it to wash or blow away with little thought of what we were doing. As these things took place, many



farmers quit their farms and moved to the city. Many lived in crowded areas where the social conditions were not conducive to good citizenship; some in surroundings conducive to the development of criminals or citizens who became a burden to society. We depended on the farmers who remained on the farms to produce food and clothing for the millions living in the cities and towns, and still we saw our land producing less per acre each year—over a long period of complacency.

What did we do to correct this growing wastage? As long as we had undeveloped land available, our population moved from worn-out areas to new sections. But today there is little undeveloped land in the United States that is suitable for cultivation.

The American businessman is an eternal optimist, refusing to believe that any problem is unsurmountable. And he shuns pessimists. The dreary tale of countless tons of topsoil going down our streams is a dismal tale to him. He may have enough black spots in his own business without taking on additional woes.

Businessmen, nevertheless, should support soil conservation programs. They should align themselves on the side of intelligence and sound action in this field of soil saving and building, just as they do in other fields of human activities. They support the Community Chest, the clinics, education, cancer control and treatment, and the war on typhoid, malaria, and tuberculosis. The Nation needs their support in the fight against erosion—another virulent and far-reaching form of disease. Erosion is at the bottom of many diseases. It probably is the father of the malnutrition that makes us easy prey to disease. I will not say the cure of erosion would nullify the need for other forms of aid to humanity, but there can be no doubt that its control would stop untold amounts of wastage and suffering, as well as reduce disease and other costly ills.

There are other reasons why some businessmen shy away from any identification with the soil-saving efforts and agencies. They are not all familiar with the full significance of soil saving. It is something that came long after they left the farm. They feel they haven't the time to acquaint themselves with the problem. Moreover, some of them are suspicious of any movement that has as its objective the improvement of conditions on the farm, recalling that many people have been trying to improve farm conditions as far back as they can

remember. County agricultural agents have been on the job for more than 35 years and there have been farmer organizations aplenty across the decades.

Some businessmen believe that too many farmers are inefficient, or lazy, or indifferent, and are not sure they can be helped.

Another reason which dampens the enthusiasm of the city businessman in the erosion problem is their belief that food is merely another commodity and can be had for a price. They haven't accepted the truth that increased populations (55,000 new mouths to feed every 24 hours) and diminished productive acres have combined to make food the number one item of importance throughout the world. Food is not plentiful and it will become less and less plentiful, even though the bins may be temporarily full of one product or another—that is, unless we set about the job of safeguarding our remaining land and improving the wasted acres to a semblance of their former usefulness. Fortunately for all of us, both of these jobs can be done. And the businessman may have a most important part in helping with the job, as we shall see.

Businessmen have already made contributions to soil and water conservation. But they haven't begun to hit their stride. Some are joining organizations such as Friends of the Land, and are reading books and articles on conservation and hearing speakers on the subject at their civic-club meetings. They are generally open-minded on the subject. Others go a step farther and use part of their advertising appropriations to support and encourage various soil-saving movements. Farm-machinery and fertilizer manufacturers and other businesses directly concerned with the farmer have realized the need for soil saving and are joining in the general movement to bring about better conditions. Some of their advertising copy and illustrations are works of art. Several national concerns have underwritten the expense of publishing authentic accounts of the present soil situation and the remedies to better it.

The American Banker's Association has an agricultural committee and its activities percolate down into the States and the smallest communities where there are commercial banks. In many States the bankers make it their business to award through their association certificates of merit to farmers and others who are overcoming erosion on their lands. These certificates are presented at public

gatherings and entertainment is provided by the banks for the guests. Farmers take these awards quite seriously. Farm magazines are selecting "Men of the Year" and "Master Farmers," and in the selection and public endorsement of these men soil conservation is made one of the important yardsticks.

Recently at Omaha a large group of American businessmen met to discuss the need for soil and water conservation and spent 3 days in almost continuous discussion of these subjects. Every one present agreed that something must be done, and speedily. They all wanted to know what they could do. Several asked the question point-blank—"What can business do?" Naturally this set the whole convention thinking and it is to be expected that much good will come of it. When 299 leaders representing all phases of American business get to wondering what they can do to aid their country in saving its soil, something worth while is most likely to come of it.

Conservation, like charity, begins at home. Water and soil held on a businessman's home grounds and the land around his plant are just as important as that held anywhere else. Soil washed out of fields improperly cared for winds up in the streams and reservoirs.

The basis of scientific water control is to hold the rainfall where it falls and to let it WALK rather than run into the streams. When your lands (no matter how limited in area) are covered up in close-growing crops such as grasses and clovers, they hold the rainfall to a very great extent and permit it to seep into the soil and later into the streams. Soil is held in place and water is conserved in the soil. One of the recent findings by conservationists is that roads are sometimes among the worst offenders in the matter of silting streams. That is, the roads and road banks which so often are not stabilized (held by close-growing grasses) pour enormous quantities of soil into the smaller streams and on into the larger ones. Businessmen anxious to do their part may find, on looking, road banks of their own which need stabilizing and possibly also excessive losses of soil and water from eroding farm lands.

Here is probably as good a place as any to point out that a businessman does not have to be a trained conservationist in order to do the work I have suggested. A phone call to the Soil Conservation Service office in his city will put him in

touch with the Government agency empowered and trained to do the job, and he will be offered free the services of a trained technician to advise him what, and how, to do. Here is one of the most democratic agencies in the entire Government in that it will help anybody, literally anybody, to overcome the problems of soil and water losses on his own land.

If a businessman owning a piece of land, large or small, applies to a supervisor of his soil conservation district (and there are districts almost everywhere), the local Soil Conservation Service technician will go over the problem with the owner and suggest a plan to meet the needs.

Before the days of Soil Conservation Service (it was established in 1935) the insurance companies, which in many States were the owners of more land than Government or any other agency, were forced to provide overseers and farm managers and to spot tenants about on their farms in order to protect the buildings and to attempt to earn interest on the investment in the lands. The nature of the problem and the shallow margin of profit involved made it almost impossible for these companies to employ competent managers, or to secure competent tenants to operate the foreclosed farms, with the result that much of the land was abandoned and most of it became subject to erosion and deterioration. Land booms following the wars pulled them out of this hole, but the experience was neither pleasant nor profitable. Under present conditions these insurance companies, along with many other landholders, are availing themselves of the Soil Conservation Service technicians. These trained men, in response to a request made through the local soil conservation district, will lay out a complete soil- and water-holding plan for each individual farm, which, if followed, will hold and improve the soil, increase yields, and provide a basis for sound farming. The insurance companies and the land-owning banks can go a step further and insist that each mortgager include, along with other essential information as a requisite to the loan on the farm, a statement covering the extent he has followed the conservation plan laid out by the Soil Conservation Service technician, cooperating with the local soil conservation district.

Bankers and lenders of money generally are in a unique position to influence the actions of land-owners for their own good and for the good of the lenders. Small-town banks have never been back-



ward in suggesting to the applicant for a loan the manner in which the loan must be used. The first words of the banker are, "How are you going to use the loan?"

Utility companies have great opportunities to take the lead in soil and water conservation and they should be among the first to embrace the opportunities. Their hydroelectric plants are run by water, a steady flow of which is essential, and their steam plants use enormous quantities of water. In order to acquire the lands which include the stream flow, these companies usually find themselves owning uplands not considered essential to their use. These lands are usually rented out or farmed haphazardly, for the utility is concerned with making and selling power, not in farming.

But the utility companies are very much interested, just as all other businesses are interested in the welfare of their country, and particularly in the welfare of the people they serve. There is no market for electricity on impoverished farms and certainly none on abandoned lands producing nothing. Electrical distributing companies, like all other companies, need the purchasing power of the people residing in their territory, as these are the people who can aid or cripple this industry. The utility cannot pick up its company and move elsewhere. It is bound down to its territory by dams, and power plants and poles and lines and buildings. Any company making use of hydrodevelopment knows the devastating results of soil pouring into the streams that provide the water to run the turbines. So the utility company has the usual interest of the average businessman, plus the increased interest by reason of its use of the regional streams.

Here for once the Government does not enter into the picture to heckle the utility operator. It says through the soil conservation district supervisors, "We will make a conservation plan on your land, regardless of size, and will work with you year by year in protecting the soil and saving water so that your properties will be more valuable and permanent. We will treat you just as we do all other landowners."

And while we are discussing utility companies, we may glance at another utility known as the city waterworks. Businessmen who fret at the cost of ordinary drinking and bathing water and at the difficulties encountered occasionally when some pronounced period of drought comes along and the

water supply is rationed might consider the possibility of getting cheaper and better water by the simple process of protecting the watershed from which comes their water supply.

Watersheds are usually above the location of a city. One of the biggest costs in providing suitable water is that of filtering the water. Here most of the difficulty is caused by soil washing into the reservoir. A little money properly spent on the watershed might work wonders in eliminating the mud and in reducing costs of cleaning the water. Large cities will have to come to this method sooner or later. Dams are not the answer to the problem; filter plants are not always the complete answer.

A reasonable amount of money judiciously spent on a watershed above a city can not only save on filtering costs but may insure a steady supply of water. Watersheds can be stabilized. For various reasons it is the Government's job to do so, and similarly the city's job to help, with businessmen taking the lead.

Businessmen need the purchasing power of all kinds of people. Eroded lands mean eroded businesses. Therefore, they should line up on the side of soil conservation.

The land problem is national; accordingly, part of the cost of its solution should be paid for by the Government. Rural representatives in Congress are mostly soil-minded. City representatives are not generally so well informed on the subject and do not always give the support that's needed. Business can give help here.

Too many have not yet fully caught the vision that the earth is our home and the soil our storehouse. We can't get along adequately without plenty of food, and food comes from productive land. Our number one resource, therefore, is productive land. Fortunately it is being cared for by our conservationists. Much progress is being made, but the job costs something and farmers can't be expected to do it alone. They need financial help and technical assistance.

Businessmen can well afford to take part in helping the Nation push ahead with a sound land-use and land-protection policy. The agriculture of the country is ready; it is business that needs some extra enthusiasm.

Many of us here on earth cannot disassociate ourselves from the land and be happy. The pull of the soil is tremendous. Those who cannot operate a farm can often have a garden and thus keep stimulating contact with the mother of us all—land.

# FARMERS PLANT TREES TO BATTLE THE WEATHER

By A. E. FERBER



What a well-developed shelterbelt looks like. These trees near Osceola, Nebr., in the Polk County Soil Conservation District, protect a field to the left from winds in summer; the road to the right from drifting snow in winter. Note shrubs on outside that prevent winds from blowing through, beneath branches of trees. Next to shrub row are medium-height trees, next to those the taller trees. The same pattern is carried out on the other side of shelterbelt, with the exception of the shrub row.

**F**ARMERS in soil conservation districts in the Northern Great Plains States—Kansas, Nebraska, the Dakotas, Montana, and Wyoming—planted over 12,000,000 trees last year, and will exceed that figure this year if enough trees of the right kinds and sizes can be obtained.

Climate, rather than appreciation of their beauty, seems to be the force behind this drive for planting trees.

The trees planted last year by soil conservation district farmers went into 5,065 acres of field shelterbelts, 10,721 acres of farmstead windbreaks, and 813 acres planted specifically for wildlife, gully control, and other purposes. This is close to the same proportion as the total plantings since 1938, when soil conservation districts began operations.

Following are the totals, by States, 1938-50

	Field shelterbelts	Farmstead windbreaks	Other	Total
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Kansas .....	2,194	5,999	3,218	11,411
Montana .....	249	1,494	145	1,888
Nebraska .....	6,100	7,803	9,261	23,164
North Dakota ..	11,893	14,508	520	26,921
South Dakota ..	6,227	15,504	414	22,145
Wyoming .....	568	425	124	1,117

Note.—The author is regional forester, Soil Conservation Service, Lincoln, Nebr.

These plantings have been made on 62,597 farms, of which 20,856 are in Nebraska; 13,589 in South Dakota; 12,833 in Kansas, 12,282 in North Dakota; 1,680 in Montana; and 1,398 in Wyoming. North Dakota leads in acres planted per farm, with  $2\frac{1}{4}$  acres. South Dakota is next, with almost 2 acres. Nebraska comes third, with almost  $1\frac{1}{2}$  acres. Montana is fourth, with  $1\frac{1}{8}$  acres. Kansas ranks fifth, with 1 acre. Wyoming is sixth, with  $\frac{4}{5}$  acre.

Some of the reasons for the greater emphasis placed on trees in the farm conservation plans, which Soil Conservation Service technicians have helped the soil conservation district farmers de-



Were it not for the trees, this snow would have been piled up in the farmyard around buildings, and in the feed lots, making it difficult to carry on the winter chores. This picture was made at the Chris Jorgensen farm near Hurley, S. Dak., in the Turner County Soil Conservation District.

velop, are found in the storms that buffet this plains country, especially in winter. Storms of the last 3 years are still fresh in mind because they made big news—communications crippled, roads blocked, livestock unable to get to feed, and ranchers unable to get feed to the stock where the protection of trees was not provided.

Soil conservation district farmers in these States know from experience that trees protect both man and beast from the brunt of storms, make it easier



to keep homes warm, keep farmyards clear of drifts, help to conserve moisture for crops by reducing the blowing of snow from the fields, and in summer help to protect crops from wind damage.

Research has confirmed some of these observations.

The Lake States Forest Experiment Station at St. Paul, Minn., reports an experiment at Holdrege, Nebr., where identical test houses were used—one protected by a windbreak and the other unprotected. The temperature was held at 70 degrees, but it took 23 percent less fuel to maintain that temperature in the protected house than in the other.

The Montana Experiment Station at Havre reports on two herds of cattle wintered on identical rations. The herd that had the protection of trees and shrubs gained, during a mild winter, 34.9 pounds more per head than the herd fed in an open lot, even though the latter got some protection from a shed on the lot. During a really severe winter, the protected animals lost 10.6 pounds less weight per head than the unprotected animals.

Other effects of trees on a farm still need to be measured by research. Among them is the amount of benefit they are to crops.

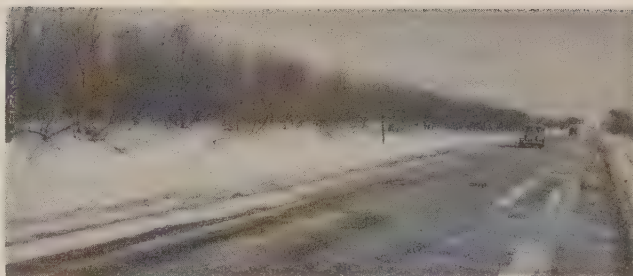
L. B. McLean of Gilby, N. Dak., with the Grand Forks County Soil Conservation District, reported: "During the 1950 growing season, when moisture conditions were below normal, the grain was much heavier for 20 rods out from the shelterbelts than the average for the field."

Dana D. Jones of Artesian, S. Dak., cooperating with the Silver Creek Soil Conservation District, reports he got several hundred dollars worth of corn to feed his livestock in 1949 entirely because of his shelterbelts. That was a year when both summer and fall were dry. There were fields both north and south of the trees.

"There was mighty little corn south of the trees," he said. "North of them, however, there was a pretty fair crop for a distance 20 to 25 times the height of the trees. Farther away the crop tapered off, and near the north edge of the fields it wasn't so good."

Hot weather and south winds coming at a critical time raised hob with the unprotected corn, he noted. But they weren't able to ruin the protected crop.

Alfred Mjoen, near Maxbass, N. Dak., has a series of shelterbelts across his sandy land, with



**This picture of a tree planting near Plainview, Nebr., in the Pierce County Soil Conservation District, was taken during the severe winter of 1948-1949, when snows were deep and drifts marooned many communities and farm families. This stretch of highway remained open. The drifts were in the trees.**

strip cropping practiced in between. The trees and strip cropping have effectively checked wind erosion. They also conserve moisture by preventing snow from blowing away. Moreover, the road alongside Mjoen's farm and that of his neighbor was open during the severe snows and blizzards of the winter of 1948-49, while the county roads nearby were completely blocked.

During the same winter, Clarence Ernst, near O'Neill, Nebr., one of the Holt Soil Conservation District board of supervisors, was able to get feed from his stacks to his livestock—one of the few farmers in that area who could. The reason for Ernst's success rests in his shelterbelt, which kept the land clear of drifting snow so that a hayrack could pass freely from farmyard to stacks.

Dartman Brothers, near Creighton, Nebr., in the Antelope Soil Conservation District, were among those who found themselves unable to get to their livestock a few miles away for as long as a week at a time. But they didn't have to rely on feed dropped from an airplane. The reason: The cattle were protected by a good shelterbelt, behind which there was a good stack of straw to carry the stock over the lean periods.

"The shelterbelt drifted full of snow," Joe Dartman said, "but prevented drifting for quite a distance on the lee side. The cattle were comfortable and could get to the strawstack. They came through the winter in fine shape, but I don't think they'd have survived if it hadn't been for the trees."

Farmstead windbreaks also did yeoman service. The Monke brothers, Rufus and Willis, near New England, N. Dak., in the Slope-Hettinger Soil Conservation District, also Fred Ehlers near Hettinger, N. Dak., in the Adams County Soil Conservation District, were able to care for their livestock handily, while many others without good

windbreaks faced many hardships with their yards choked by mountainous drifts.

Do windbreaks really help the livestock? The research quoted earlier says they do. So, also, say many farmers, one of whom is A. T. Heinig near Wichita, Kans., who is in the Sedgwick County Soil Conservation District.

"I used to have no trees around the farmstead," Heinig observes. "During the winter months, snow drifted in the yard and feed lots. The house was hard to keep warm, the livestock suffered severely on windy days, and I nearly froze doing chores.

"Now, with the windbreak well established, there is surely a difference. My house is much easier to keep comfortable. Snow doesn't drift around the farmstead. It takes less feed for the livestock. In fact, the livestock and I hardly know it is winter unless we get out from behind the protection of the trees."

The rigorous climate still continues on the Northern Great Plains. Even this year, there was a scramble for equipment to open up lanes to feed supplies and to clear out the drifts from unprotected farmyards.

Many farmers hesitate to start a windbreak because they feel that it will be years before they get any benefit from the trees. There are many others, however, who have found that isn't so.

Warren Patefield near Laurel, Nebr., a member of the board of supervisors of the Cedar County Soil Conservation District, reports that even though this year's March storms were something to remember for a long time, his 3-year-old windbreak kept the snow from drifting into his farmyard.

Paul E. Ode and sons near Brandon, S. Dak., in the Minnehaha Soil Conservation District, found that all last winter a 2-year-old shelterbelt planted across the highway to the north kept the drifts out of the yard.

"The trees kept the road passable, too," Ode said, "even during the March blizzard. The only snow on that strip of highway was the snow that fell there. It was amusing to look at the snow here, and then at the place farther down the road where they were trying to open it up with snow plows."

In summer this same shelterbelt will help to protect the field to the north from wind erosion.

It is no wonder that farmers in the soil conservation districts in the Northern Great Plains are planting 12,000,000 trees a year and would plant

more if they could get them. The Soil Conservation Service aims to help out by supplying half the number, but has not been able to boost its production to keep pace with the increase in planting.

No haphazard combination of trees will do. A successful windbreak needs a shrub row, an evergreen row, tall trees and some not so tall, some faster-growing than others—and all adapted to the area where they are planted. In the right combination, they produce an effective windbreak in the shortest time practicable.

The soil conservation districts in the four States where planting is heaviest have been aggressive in trying to enlarge the supplies of suitable planting stock. Supervisors of soil conservation districts in Kansas, Nebraska, and the Dakotas now contract with commercial nurseries for the production of desired trees.

The North Dakota districts association, in addition, has acquired its own nursery to supplement the planting stock produced by commercial nurseries.

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**FARM PONDS AND FIRE INSURANCE.**—Massachusetts farmers who have ponds and who live within 3 miles of a fire-department station are now getting a lower fire-insurance rate. This is the result of 3 years' effort by the Berkshire Soil Conservation District headed by Chairman Jesse H. Fairfield.

The old basic rate was flexible, ranging from \$1.15 upward and averaging about \$1.50 per \$100 value. The new base rate is \$1.30.

Under the new schedule there is a *deduction* of 25 percent if the property is within 3 miles of a fire-department station and 500 feet of approved water supply—a hydrant, a dammed stream or pond, or a water supply that will provide 250 gallons per minute for an hour, and if the town is in grade C. For grade E towns the *deduction* is 10 percent, with variations for longer distances.

If the farm has a fire-extinguisher warranty there is a 5-percent *deduction* from the base rate. If there is an electric-rod warranty the *deduction* from the base rate is 10 percent. If there is electric wiring, all in conduit or cable, and the farm is located on a hard road which can be traveled at all times, the *deduction* is 10 percent from the base rate.

If the property does not have such protections, the 5-, 10-, or 25-percent deduction becomes an *addition to the base rate*. Chimneys without tile or metal flues get a 25-percent boost in rate.

"One farmer I know saved \$250 a year on his insurance after having his cow-barn value raised from \$19,000 to \$31,000," says Fairfield.

The new rate became effective May 1, 1951.





Pineapples in contoured field. The mulch is left from trimming prior to harvesting. U. S. Allison, SCS, is at left; Fiddler, right.

## STEEP BUT SAFE

By E. T. FIDDLER

**M**Y farm, known as Cidra Farms, contains about 470 acres. It is located near the center of Puerto Rico at an altitude of about 1,500 feet above sea level, in the Torito Soil Conservation District. It is partly flat, partly rolling, and partly hilly, and is cut by sharp ravines which contain many springs and small streams. The average annual rainfall is 86 inches, with occasional torrential downpours.

The farm had been devoted some 20 years ago entirely to the growing of pineapples. When acquired by me in 1934 it had been abandoned and overgrown for about 4 years. At present about 280 acres are devoted to the intensive cultivation of pineapples and sugarcane. The system is to rotate the two crops on the gentler slopes, taking off three to four crops before replanting. This, I think, is unique in Puerto Rico.

In 1944 the Soil Conservation Service took an interest in the farm and agreed to help with the soil

conservation work for a period of 5 years. The results have been wonderfully satisfactory.

All planting of both pineapples and sugarcane is done on the contour, with terraces. This has presented some interesting problems, not only on the steeper slopes but also, and especially, on land which apparently is almost flat. It has required quite a bit of ingenuity to lay out terraces and contours on these flat lands especially for the production of pineapples, which cannot stand wet feet.

Low spots which never produced well have now been drained under the guidance of SCS technicians. Pineapples now are planted on the flat lands and much heavier yields result. The hillsides are reserved for cane, which permits far less washing than pineapples.

One of the favorable results from the planting of pineapples on contours on relatively flat land is that I am able to take off an additional crop before replanting. This means a tremendous saving, as the planting of pineapple slips is very expensive. The double-row system is used.

The reason an additional crop can be obtained is that the pineapples on flat land now do not have to be planted on banks but may be planted flat on the ground. This is because of improved drainage. The second crop, which is always higher than the

Note.—The author is an attorney at Santurce, P. R., and the owner-operator of a farm near Cidra, P. R.





Excellent sugarcane (on contour) on Fiddler's farm.

first, does not fall over but tends to spread on the flat land. Little banking is needed after the first crop.

Heavy banking is now reserved for the third crop instead of the second. At the end of the second crop the banks formerly were so high that it would have been impossible to bank for the third crop without much more space between rows. The heavy banking of the third crop, which is now possible, brings up the production of the third crop to where it is almost equal to the first and second crops. The annual average production of pineapples by this system has been increased in the last 5 years from approximately 13 tons per acre to almost 17 tons per acre.

Contouring and terracing of lands planted to cane have given equally gratifying results but for a very different reason.

The terraces serve as roadways so that trucks can reach every part of the canefields even where the slope is quite sharp without the necessity of using oxen to haul out cane. The terracing and contouring, of course, prevent washing even on the steeper slopes. Cane production per acre on this farm compares favorably with cane production on the flat coastal lands and is higher than on any other farm in its part of the island. New varieties are being

substituted for POJ-2878 which give a higher yield both in tonnage and in sugar.

The number of animals used for work purposes on the farm is now limited to a pair of oxen and three mules. The oxen are used only to finish off corners of fields in plowing which cannot be reached by tractors and in plowing hillsides which are too steep for tractors. The three mules are used entirely for cultivating between the rows of cane and pineapples. This, of course, represents a tremendous saving.

Two 40-horsepower tractors are used for farm work. Disk plows are used except for the hillsides. Soil is limed before each planting, the purpose being to bring the acidity to about 5 to 5.5 pH.

The ravines are wooded. No highly cultivated crops are planted on the slopes. The sharper slopes which are not in the ravines are now being devoted to pasture and the beginning of a dairy. By planting and management of pastures, I believe that the lands available for pasture will support 40 to 50 milk cows.

The sharp heads of ravines present a special problem which is being solved by cutting back the sharp banks and planting the slopes in heavy grass and kudzu. Of course, the dispersal of water into the ravines by the carefully worked out system of terraces helps greatly. Since the farm is on a watershed, the fall of which is very precipitous and the rainfall relatively high, it is not at all improbable that this productive farm would entirely disappear in the next 50 years if the steps now being taken to protect the ravines are not continued. With the work we are doing, with the valuable aid of the Soil Conservation Service, the present condition should be permanent. Even under the heaviest rainfalls, practically none of the topsoil is now washed away. The rain is absorbed and runs off through underground drainage, aided by deep subsoil plowing.

## SPORTSMEN AND FARMERS

(Continued from page 26)

betterment. These farmers have planted 200,000 bicolor lespedeza seedlings and bordered them with strips of sericea lespedeza. Both are excellent quail feed.

The plantings help tie down farm land and protect it from wind and water erosion. They were made in corners and nooks not lending themselves to cultivation.

Sportsmen formed an association to cooperate





with the district and gave farmers more than \$300 to buy seed and fertilizer. An 80,000-acre game preserve was established in the northern part of the district.

Another big important result came when the Texas Game, Fish, and Oyster Commission bought 7,200 acres for a game-management program and agreed with the district to determine how wildlife conservation could be dovetailed into east Texas soil conservation work. A restocking program is under way, with deer, beaver, and wild turkey released to run loose in the area.

The farmer, once leery of city sportsmen, takes a different view now that they come with fertilizer, wildlife plants, and understanding of the farmer's problems. That kind of cooperation makes the farmer more willing to let city sportsmen do some hunting or drop a line in some of the many fish-filled farm ponds being constructed in the district.

The Wildlife Management Institute plans to make another wildlife conservation award next year in connection with the *Press* contest.

**FLEXIBLE PARTNERSHIP.**—Today's farmer has learned that by working in groups with his neighbors he gets many things done which he might not accomplish alone.

Farmers in the Rucker's Creek area near Granbury, Tex., have been banded together in a community conservation group for several years.



Rucker's Creek conservation group inspects bluestem planting on King Ranch.

In 1948 members of the community wanted to plant some grass seed but they had no drill, so they sold enough \$25 shares to buy one. Each shareholder was allowed to seed enough land at a 50-cents-an-acre rate to repay his investment.

In the next 2 years they purchased two more grass-seed drills, two fertilizer drills, and a spray. The group-owned equipment, valued at \$3,000, is rented at a nominal fee to farmers throughout the Hood-Parker Soil Conservation District.

Group members repainted and repaired an abandoned schoolhouse which they use for monthly get-togethers. They help one another plant and harvest peanuts, harvest grass seed, build fences. They pool their tractors to build terraces.

Last spring the group met at the home of X. A. Meyer for its fifth annual field day. The men toured one another's farms while the women prepared lunch for the gathering of about 60 persons. Afterward, they held a soil conservation program and talked plans for the coming year.

—GORDON TOMPKINS.

## TREES, BOYS, AND DAD

We have been planting seedling evergreens. This year we had 500 Norway spruce and 500 red pine from Soil Conservation Service. We also set out 50 multiflora roses along a fence.

The first trees we planted 5 years ago now stand 4 to 5 feet high. They really show up on our steep hillside. The trees start slowly, but after 2 or 3 years they really jump along.

One of the nicest parts of tree planting is that we get an opportunity to get acquainted with our 15-year-old son Will. I open the hole for the tree with a spade and Will slips in a tree from those parked in a pail of water.

We have a chance to talk over school work, the church youth organizations and what they are doing, the kinds of trees we are planting and what they can be used for, how plants and animals grow, and dozens of other facts of life.

A good many years ago we used to hoe cabbage alongside the boss, and we could talk over happenings, but nowadays with tractor and modern equipment there are not too many opportunities to work side-by-side and pass the time of day; so we are glad for the tree-planting opportunity.

We did the same with son Fred who now is a full-fledged Marine. We shall never forget the hours spent on our side hill working with the boys.

—TED TOWNSEND, Farm Editor, Utica, N. Y., Daily Press; a cooperator in the Oneida County Soil Conservation District at Sangerfield, N. Y.





**HISTORIC OCCASION.**—At Kansas City, in June, officers of the National Association of Soil Conservation Districts came together for the first time to discuss problems with other agencies, in addition to the Soil Conservation Service. Major consideration was given to (1) Association affairs, (2) the program for greater service, and (3) the development of closer working relationships with other groups.

In consultation were brought representatives of the Soil Conservation Service, the Production and Marketing Administration, the Forest Service, the Department of the Interior, and the Office of the Secretary of Agriculture.

Association officers are pictured above. Top row—Kent Leavitt, Millbrook, N. Y., past president; Gordon McGowan, Highwood, Mont., director; Daniel M. McKeon, Ridgefield, Conn., director; Don Anderson, Honey Creek, Iowa, director; Otis Tossett, Lansford, N. Dak., director; W. T. Nolin, Hamburg, La., director; D. J. Doneen, Farmington, Wash., director; Emil W. Heck, Lawrence, Kans., president of Kansas association.

Middle row—Lawrence McKinney, Wingate, Ind., director; W. A. Williams, Jr., Santa Fe, N. Mex., director; George Barton, Manti, Utah, director; Clay H. Stackhouse, Wakeman, Ohio, National vice president; Waters S. Davis, Jr., League City, Tex., National president; A. B. Adams, Clarksdale, Miss., director; A. Threlkeld, Corinth, Ky., director.

Bottom row—W. A. Groom, Grand Junction, Colo., area vice president; Everett M. Barr, Liberty, Nebr., area vice president; Nolen J. Fuqua, Duncan, Okla., area vice president; Herbert B. Eagon, Delaware, Ohio, area vice president; W. E. Silverwood, Redlands, Calif., area vice president; W. F. Hall, Sparta, Ga., area vice president; George R. Heidrich, Charles Town, W. Va., area vice president.

**HOSPITAL FARM RECOVERS.**—In 1945 the farm at the Marcy (N. Y.) State Hospital was badly afflicted with erosion. It wasn't producing a normal supply of food and feed to help meet hospital needs. Much of the land was poorly drained.

A complete conservation farm plan was developed and applied in 1946 by the local district and SCS technicians. By 1947 the land was "doing as well as could be expected." In 1948 it was "getting along nicely." In 1949 it was "much better."

In 1950—as reported by the N. Y. State Department of Mental Hygiene's *News*—the business and farm manager "looked at well-filled corn cribs and silos, and haylofts brimming over with alfalfa of su-

perior grade, and estimated that production from reclaimed acres had increased 50 percent. One 52-acre field yielded as much corn and hay in 1950 as it did in two combined previous years. It took much less time for soil cultivation and preparation to produce 1950 crops than was formerly required to produce half of that harvest. . . .

"The average production per cow per year b. c. (before conservation) was 9,000 pounds. In 1950 it averaged 11,150 pounds per cow per year . . ."

This production from 58 milk cows is 58 times 2,150 pounds of milk above average for the year, or 124,700 pounds. At about \$4.50 per hundred-weight, it represents \$5,611.50 in extra milk income.





OCTOBER 1951

# Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

# SOIL CONSERVATION•

CHARLES F. BRANNAN

SECRETARY OF AGRICULTURE

HUGH H. BENNETT

CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE

WASHINGTON, D. C.

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### WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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**CONDITIONAL SALE.**—Albert Kipfer, a former director of the Menominee County (Mich.) Soil Conservation District, recently sold his farm under a unique contract provision which makes it mandatory for the buyer to follow the established soil conservation practices and the recommendations of the district.

**WILLING ACRES.**—A 60-minute, sound-color film, sponsored by The Keystone Steel and Wire Co., Peoria, Ill., and produced by The Venard Organization of Peoria, is dedicated to America's farmers who would use their acres wisely.

While primarily concerned with the conversion-to-grass angle of soil conservation,

(Continued on page 71)



**FRONT COVER.**—This view is of the farm of Blake Boyd, Holmes County, Ohio. Contour strips in lower right are on the adjoining farm of Robert Troyer. The pond at the left was built under the supervision of Soil Conservation Service technicians, as part of the conservation plan. The photograph was made by Dick Burwell.



# DISTRICTS PROFITABLE CUSTOMERS OF LOCAL GOVERNMENTS

By HUGH F. EAMES

FOR the use of publicly owned highway equipment in installing conservation farm plans in 1948, 1949, and 1950, nearly 400 district farmers in Wyoming County, more than 300 in Chautauqua County, and over 100 in Steuben County paid more than \$100,000 into town and county treasuries in New York State.

This extra income has been an important factor in reducing public debt and strengthening the financial status of local governments. It also has made it practicable to buy modern labor-saving equipment that will do public work more efficiently.



This bulldozer, owned by the town of Perry, N. Y., is building a pond on the John MacMurray farm.

What these cooperative operations mean to the taxpayers of these three counties and their subdivisions is shown in official reports of the revenue each has received from the district cooperators:

County	1948	1949	1950	Totals
Steuben	\$ 1,662.40	\$17,459.32	\$15,888.18	\$35,009.90
Wyoming	14,087.69	12,497.60	11,881.37	38,466.66
Chautauqua	9,462.01	13,355.43	5,770.94	28,588.38
Totals	\$25,212.10	\$43,312.35	\$33,540.49	\$102,064.94

In addition to the 3 county treasuries, the funds of about 50 town or township governments have been augmented importantly.

In Steuben County, for example, Pulteney has received \$9,336.50, Hartsville \$7,506.30, and Bath \$6,153.41 in 3 years.

Hanover, in Chautauqua County, has been paid \$9,074.

In Wyoming County, Perry has received \$4,890, Wethersfield \$5,394, and Sheldon \$8,701.

When the town of Bath, in Steuben County, received two district checks totaling \$7,720.69, it became debt-free for the first time in 10 years. Wiping out of public debt was accomplished in the face of ever-increasing post-war expenses and machinery certificates (debt) exceeding \$50,000. In 5 years the district has paid \$8,230.16 into the Bath treasury, and \$8,821.38 to Pulteney. In 4 years Hartsville has received \$9,792.85.

Because of opportunity to keep modern highway equipment in steady use, by cooperation with soil conservation districts, county and town officials have consulted with SCS technicians and district directors for guidance in buying the kind of equipment that is most useful.

Towns and counties do not receive the same payment as private contractors for use of their equipment. In New York State the rates for use of State, county, and town machinery are set up by the State Department of Public Works and the Office of the State Comptroller. In general, they are about 25 percent less than the rates charged by private contractors.

Conservation farmers like these cooperative arrangements with towns and counties because heavy "moving-in" expenses are eliminated. A disadvantage sometimes is the inability to get the use of the equipment just when it is wanted, but this is offset by the lower costs that make waiting worth while when there is a lot of work to be done.



Grader owned by Warsaw, N. Y., here is building a dike on the Coe-Carpenter farm, in Wyoming County.

Note.—The author is with the regional information division, Soil Conservation Service, Upper Darby, Pa.

# GREEN REVOLUTION

By HUGH BENNETT

**S**OIL conservation is turning the United States green. Green pastures, green woodlands, and green landscapes are covering up millions of acres where, a few years ago, little or nothing was produced, where erosion was severe and fields were bleak and gullied.

Look at the South: That section is rapidly turning over a new leaf—a green leaf—in its progress toward a well-balanced, sustained, and profitable agriculture. Pastures are being developed on a rapidly expanding scale. Pine woodlands are being protected from fires and excessive grazing. The land is being used for what it is best suited to produce, and safeguarded from erosion.

This revolution on the land began with the establishment of the conservation program in the early thirties. There was agricultural improvement before that epochal date, to be sure, but it was more or less of a local nature and to a large degree overlooked sound land use. The discovery that pine trees were a merchantable crop helped some sections to get started. But it was the conservation program—good land use and protection of the land from erosion—that really brought on the revolution. This paid the highest dividends southern farmers had ever known. And it has been much that way throughout the country.

In the South, grass, milk, beef, pine trees, and good land use and protection made up the pattern of revival. Southerners were the first of the Nation to try to halt the destructive inroads of erosion, but the one-practice system they started out with—hillside ditching—back in the early 1800's, was the wrong system, although temporarily helpful on some farms. Those early attempts at soil and water conservation were quite generally restricted to terracing. There was little thought of land use. Vast forests of pine and mixed pine and hardwoods were cleared without regard for the suitability of the land for cultivation. Literally millions of acres of fine woodlands were stripped of magnificent stands of pine and hardwoods on slopes too steep for cultivation of any kind. These lands were not long going to waste by way of rapid ero-



**Bees are necessary for good seed production from the clovers. These hives, belonging to Clyde Hansen, of Livingston, Ala., are on the farm of Sheldon Sheffield, of Greensboro, Ala.; the honey is regarded as fair exchange for the pollination services performed.**

sion. Not only was the land ruined for cultivation but vast quantities of valuable timber were wasted.

From the beginning, the Soil Conservation Service based its work on using the land as nature made it (that is, according to its capability), and protecting it from the ills of erosion, waterlogging, and other deficiencies resulting from man's careless use of the land. This program has lifted the South's agriculture out of a variety of fundamental difficulties, as it has done, also, for the entire Nation. When the job is completed—it could be completed, and ought to be, in about 20 years—our agriculture at last will be on a sound, stabilized, and orderly basis.

With the initial program completed, the task will be to give diligent attention to maintenance and improvement. If better varieties are discovered, or better methods of fertilization or cultivation—whatever the advances in science or technology—farmers and ranchers will be entitled to the fullest possible advantage.

In May 1951 I made a trip of inspection through the Southeast—across Virginia, the Carolinas, Georgia, Alabama, Mississippi, and Tennessee—to see just what was taking place out on the land. For many years I have been intimately acquainted with the region, having visited every county of the seven States—not sightseeing, but studying the land and its needs. I have lived with its agriculture and kept close scrutiny of its progress, or lack of progress, since the first of July 1903, when I began work in the old Bureau of Soils, classifying soils and studying local and regional land conditions. I witnessed the harvesting of the South's vast forests and the use, or misuse, of the lands that were brought under the plow as the result of the stupendous lumbering operations.



I vividly recall the old-fashioned log-rolling jamborees and the wholesale clearing of millions of acres that were put into cultivation more or less without regard to the adaptability of the land. And I witnessed, too, the burning of vast quantities of valuable timber cut down in these clearing operations in order to have "new ground" to replace the erosion-impooverished fields that had been brought to the lowly level of producing "bumble-bee cotton" and "7-bushels-per-acre corn."

On the soil survey I sometimes worked a little late during winter and spring just to see the nightly spectacle of girdled trees—often fine longleaf pine—purposefully burned to get them "out of the way" of plowing. The fires were most spectacular on dark nights. Along the entire length of these dried-out girdled trees, still standing, one saw intermittent brilliant flares as blazing broke out from extra-resinous spots in the wood. These could be seen at intervals from the ground up to 40, 50, and 60 feet above the ground. Now and then the whole burning upper part of a tree would come tumbling down in a spectacular burst of sparks. With February and March winds, these burning areas were unsafe to drive through, so that we sometimes had to look for overnight accommodations at a neighboring farmhouse.

Sawmills of those early days were big mills for the most part. Small, portable outfits had not come in to any great extent. Small operators were generally unable to sell boards and cross ties for a worth-while profit.

And, too, I became painfully familiar with the widespread impoverishment resulting from sheet washing as well as devastating gullying. Some of the erosion effects we ran into were astonishing indeed. They made me wonder about the economics and agricultural teaching of those days. Some of the scholarly classics had overlooked some extremely fundamental land facts, apparently because the authors had not really seen what they had been looking at during and after heavy rains.

In 1910, when we were making a soil survey of Lauderdale County, Miss., we were astounded to find, while traversing the main highway leading south from Meridian, along the crest of one of the highest ridges in the county several places where gullies, ascending the slopes from opposite directions, had cut into one another across the crest of the ridge to such depth that bridges had to be built to keep the road open for traffic. The gullies, of

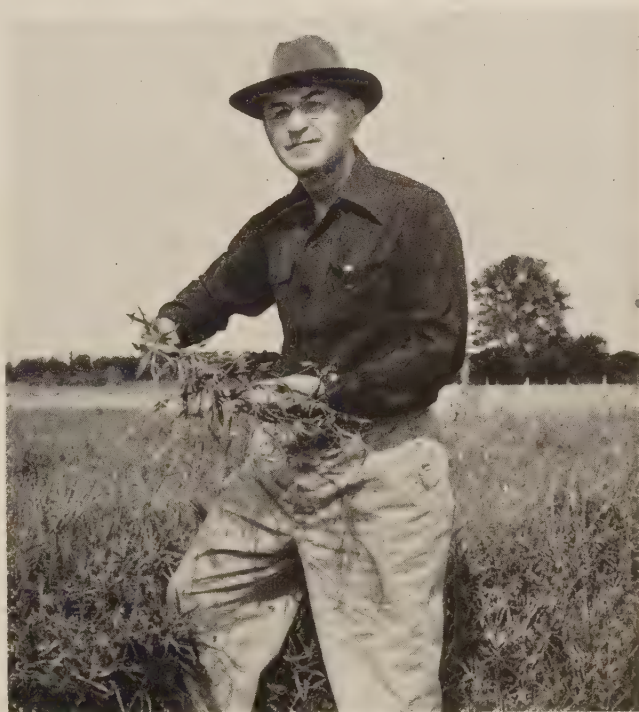
course, had not cut out their deep channels by any process of water running uphill; they simply had extended their channeling upslope by the cutting effects of water running in at the upper ends. In this manner, the cutting beginning on lower slopes gradually worked up to the crest of the divide from both sides of the road, where the two incisions joined.

In another part of the county we were trying to close a plane-table traverse one day by joining up with the main road to the east of a side road we had surveyed out from the main road to the west. We had encountered along the side road a severely gullied area that had obliterated all evidence of a negotiable roadway. Not to be outdone (and we were young enough for that at the time), we unhitched our horses and got them across the gullies on foot. Then we took the buggy apart and somehow got it over piece by piece. Putting the parts back together, we inspanned and continued the survey. After a bit we came to a farmhouse, by the back way. The farmer came out, obviously puzzled at our sudden appearance from a direction no vehicle had traveled for decades.

"Howdy, boys! How are you getting along?"

"Well, sir, just now we are doing pretty good."

"By the way, where did you drive in from?"



Caley-peas are a standard legume crop in the Black Belt of Alabama. P. G. Compton, of Gallion, regards with satisfaction the growth on this field after a winter of grazing by his dairy herd.



"We drove in from Hog Nose Creek road."

"Rough going, wasn't it?"

"In spots, yes."

"Just how did you come?"

"We came along the fence, north side of that cornfield over to the west of here, and then straight along through the woods."

"Didn't you run into a lot of gullies?"

"At one place there were some gullies, yes."

"Well, I am glad to see you fellows, and I hope you won't run into any bad road conditions on your way out to the Meridian road. I suppose you must have had some particular reason coming the way you did?"

"No special reason except that we're making a base map for our soil-survey work in Lauderdale County, and we wanted to tie up with the road east of here which we surveyed some time ago, so as to correct any error that might have crept into our measurements."

"Well, I think I may see what you mean; but anyway I want to say you are the buggy-drivingest boys I ever saw. Won't you come in and have a bite to eat with us; dinner's ready."

And, of course, we were ready, as usual!

Getting back to the story: these items I have set down in order to develop something of a basic perspective of what was going on in much of the Southeast, and other parts of the country, around a half century ago—vast soil and water losses, timber wastage, slopes that were gullied, bare, brown, and bleak from October to April!

On this recent trip I saw, for example, pine forests, in solid stretches of beautifully growing green trees, sometimes 10 miles across, where, in the old cotton belt of central Georgia, I had seen, before the boll-weevil exodus of the farm population, cottonfields and cornfields in almost endless array.

I saw, also, in every State, a large increase in pastures—good pastures, with good stands of adaptable grasses. These I saw on the sandy lands of the coastal plains country, on the Piedmont clay lands, in stream bottoms, and throughout the Alabama-Mississippi Black Belt. It was springtime; the pastures—every one of them—were carpeted with the greenest of grasses, often mixed with white clover in sparkling blossom. Both beef and dairy cattle were of good breeds and grades, and everywhere were reported as money makers.

A matter that seemed of much importance was the way the livestock industry is spreading all

through the South, even in the sand hills, an area which a couple of decades ago was generally considered too poor for grass. We now have adaptable grasses for nearly every part of the country. The story of what the Service has done in ascertaining the grass needs of the various parts of the Nation and in developing seed supplies to help meet these needs reads like a miracle.

The Soil Erosion Service (trail blazer of the Soil Conservation Service) started work in September 1933 during the great drought. Early in its life, the Service came to a critical period when it desperately needed better grasses to combat dust storms that were afflicting millions of acres in the Great Plains. It soon developed that we not only didn't know very much about what grasses were



Here examining a stand of pasture grass on the Holmes farm are A. D. Holmes, Jr., of Gallion, and Willie Tucker, district conservationist. The mixture is Suiter's grass, Caley-peas, black medic, smooth vetch, and lap-pa clover. Holmes is a supervisor of the Black Belt Soil Conservation District.

particularly suited to the various problem areas of the country, but there was no seed supply of a great number of native grasses. Accordingly, when the Service was moved from Interior to Agriculture, there came the opportunity for it to do something about the matter. Something was done—quite promptly.

I was told in my first Department of Agriculture interview as Chief of the Soil Conservation Service that the new soil conservation nurseries were to be operated by us. Here was the golden opportunity. I gave immediate instructions to our nurserymen to go out along the highways and by-



ways and bring into the conservation nurseries every native grass and legume, together with all strains and varieties thereof, which showed any promise of fitting usefully into any particular niche of the Nation as a good or better pasture or ranch grass, or as a worth-while soil-saver. This was done all over the country, and eventually something over 40 grasses and legumes were domesticated and put to use in the control of erosion by both wind and water. Among the most outstanding and extensively used are the 22 included in table 1, where also are shown the results of 1 year's collection of seed attributed to the efforts of the Service.

TABLE 1.—*Twenty-two native grasses now in extensive use, whose domestication was attributable directly to nursery observational studies of the Soil Conservation Service, together with quantities of seed harvested in 1950*

Name	Seed harvested 1950 as result of SCS efforts
	Pounds
Sherman big bluegrass.....	101,000
Bromar mountain brome.....	215,000
Cucamonga brome .....	5,500
Beardless wheatgrass }.....	16,000
Whitmar beardless wheatgrass }	
Primar slender wheatgrass.....	114,000
Western wheatgrass .....	33,000
Elreno side-oats grama }.....	403,000
Vaughn side-oats grama }	
Blue grama .....	401,000
Slender grama .....	13,000
Blackwell switchgrass .....	16,000
Sand lovegrass .....	618,000
Purple needlegrass }.....	6,000
Green needlegrass }	
Big bluestem .....	263,000
Little bluestem .....	1,381,000
Sand bluestem .....	22,000
Buffalograss (burs) .....	16,000
Yellow Indiangrass .....	368,000
Indian ricegrass .....	1,000
Sand dropseed .....	350
Total .....	3,992,850

At the time this observational work was started in the nurseries, the grasses listed here were not quoted for sale in any seed catalogs we could get our hands on. In the instance of western wheatgrass, for example, I heard a prominent seed dealer say that when the Soil Conservation Service began this work he was sure that no one could have bought a spoonful of this seed in any seed house.

"Now," he said, "I can supply western wheatgrass seed in carload lots."

We had much the same experience with the other natives listed, and still additional ones are under observation. Some of these have come into such common usage that the trade pretty well takes care of the supply, without Service assistance.

Again, take western wheatgrass: In early days of seed collection, the Soil Conservation Service was, directly and indirectly, responsible for harvesting from the wild more than a half million pounds of this useful grass. In 1950, however, only 33,000 pounds were collected. Seed of this grass can now be obtained from various seed houses.

Little bluestem, on the other hand, was either grown on the Service nurseries or harvested from the wild at the suggestion of the nurserymen, in 1950, to the extent of 1,381,000 pounds.

At one time Atlee L. Hafenrichter and his associates showed me several hundred strains of big bluegrass (*Poa ampla*) and others that were being observed on the soil conservation nursery at Pullman, Wash. "Haf" had observed many of these strains as he traveled about the country and had found others while collecting promising looking plants for his nursery observational work. Now the best of the numerous varieties and strains have been fitted into adaptable places of the Palouse's agriculture.

The Service has had a hand in spreading the use of the more promising of the introduced grasses, together with several new strains of these found by our nursery personnel, to adaptable areas in nearly all parts of the country. Many of those which farmers had successfully used here and there have been spread widely to adaptable areas.

Take, for example, Suiter's grass (called tall fescue or Kentucky fescue): A hundred pounds of seed of this were bought in 1941 by the Soil Conservation Service from the Suiter farm in eastern Kentucky and increased in quantity on our nursery at Chapel Hill, N. C., sufficient to supply seed enough to soil conservation districts in the Southeastern States to plant one or more 5-acre seed-increase plots in 686 counties. From this, Suiter's grass has spread well across the Southeast and far beyond on a tremendous area found to be well suited to this splendid grass, which remains green and palatable deep into winter. When I was in Texas in March, this year, I saw a large planting of Suiter's grass in the coastal prairies section west

TABLE 2.—*Pasture and range improvement work in 13 Southern States planned and applied to the land in soil conservation districts with Soil Conservation Service assistance cumulative to December 31, 1950<sup>1</sup>*

State	Pasture improvement		Range improvement	
	Planned	Applied	Planned	Applied
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alabama .....	1,367,063	1,018,377	-----	-----
Florida .....	1,435,998	450,050	459,408	182,001
Georgia .....	1,726,953	1,265,219	8,156	3,291
Kentucky .....	1,462,723	1,035,377	-----	-----
Mississippi .....	1,799,715	1,345,088	2,275	145
North Carolina .....	491,909	381,310	-----	-----
South Carolina .....	428,220	287,480	716	703
Tennessee .....	512,358	379,543	-----	-----
Virginia .....	964,810	711,693	-----	-----
Southeastern States Total .....	10,189,749	6,874,137	470,555	186,140
Arkansas .....	2,085,094	1,290,605	80	80
Louisiana .....	1,056,943	755,866	15,334	5,232
Oklahoma .....	1,925,790	1,042,672	5,224,065	3,906,793
Texas .....	3,899,387	1,924,268	24,153,999	13,962,052
Western Gulf States Total .....	8,967,214	5,013,411	29,393,478	17,874,157
Total 13 Southern States .....	19,156,963	11,887,548	29,864,033	18,060,297
Percent of national total .....	59.3	63.0	36.7	37.4
National total .....	32,323,753	18,862,970	81,341,577	48,324,583

<sup>1</sup> Compiled from work reports of the Soil Conservation Service showing pasture and range work completed in soil conservation districts.

of Houston, where I saw, also, some 400 visiting Canadian geese grazing on this grass.

Similarly, the Service has spread the wild winter pea for winter grazing over the Alabama-Mississippi Black Belt and widely into adjacent areas. Blue lupine, an importation, scarcely used 10 years ago, now is on hundreds of thousands of acres as a green-manuring and soil-holding crop, principally on peanut land. This was started by the Soil Conservation Service with a few pounds of seed obtained from the Florida Agricultural Experiment Station, where there was a small station-produced supply. Representatives of the Peanut Growers Association of the Southeast came to my office early in World War II and earnestly solicited Service help for the peanut program. This was readily agreed to, and we were able to control erosion very well by getting a cover of blue lupine on the land to protect it following harvest.

During my recent trip in the Southeast, I saw, in one continuous body, near Montgomery, Ala., 90,000 acres of black-belt upland planted to pasture grasses (mainly Dallis and White Dutch clover, with an overseeding of Caley-pea in many places for winter and spring grazing). Again, I saw the same thing on 150,000 acres in the black-belt section, near Demopolis and Greensboro, Ala. All these pastures were being used for beef and dairy

purposes. Most of the animals were purebreds or high-grade cattle. *The 150,000 acres of land was practically a continuous block of pasture.* Most of it had been eroded under cotton and corn to such an extent that the original black topsoil had been stripped off, down to a yellowish-brown, limy clay subsoil. Previously, I had seen all of this land in cotton and corn, and had mapped a good deal of it while doing soil-survey work.

*Probably this wholesale change from cotton and corn to grass had never been equaled anywhere else on earth. I think it undoubtedly represents the world's best and biggest example of a complete, quick transformation from one set type of agriculture to a distinctly different and much better type of agriculture. The Soil Conservation Service, working with farmers, planned most of this, farm by farm. Some of it was the result of the spread of practices from the original work of the Service.*

Table 2 shows how the improved pasture and range movement is progressing in the Southern States, compared with the Nation as a whole. Of the nearly 19 million acres of improved pasture in the United States, for which plans were made by the Service, the 13 Southern States (where the work consisted largely of establishing new pastures) have developed nearly 12 million acres, or 63 percent of the total. Of the 48 million acres of



TABLE 3.—Census figures on "All Cattle and Calves," for 1940 and 1945 census years and BAE estimates for 1950,<sup>1</sup> together with increase of 1945 and 1950 over 1940 reports

State	1940	1945	1950
Alabama .....	889,983	1,282,378	1,476,000
Florida .....	721,015	1,114,917	1,503,000
Georgia .....	803,357	1,140,416	1,330,000
Kentucky .....	1,130,152	1,417,585	1,721,000
Mississippi .....	1,139,660	1,655,084	1,791,000
North Carolina .....	540,015	721,177	788,000
South Carolina .....	274,586	389,287	396,000
Tennessee .....	1,108,869	1,427,272	1,550,000
Virginia .....	815,517	1,030,420	1,197,000
Total Southeastern States .....	7,423,154	10,178,536	11,752,000
Arkansas .....	982,173	1,259,139	1,282,000
Louisiana .....	1,051,901	1,475,425	1,569,000
Oklahoma .....	2,194,647	3,101,301	2,814,000
Texas .....	6,281,537	8,864,425	9,260,000
Total Western Gulf States .....	10,516,258	14,700,290	14,925,000
Total 13 Southern States .....	17,933,412	24,878,826	26,677,000
Percent increase over 1940 .....		38.7	48.7
United States Total .....	60,674,736	82,654,417	84,179,000
Percent increase over 1940 .....		36.2	38.7

<sup>1</sup> Release on "Livestock and Meat Situation," Bureau of Agricultural Economics, as of Jan. 1, 1951.

range improvement, the 13 Southern States accounted for 37 percent.

Table 3 summarizes the statistical movement of the cattle industry in the country, as indicated by

the numbers of "All Cattle and Calves" for the years 1940, 1945, and 1950.

This is part of the story of the Green Revolution—principally what it is doing for the country and how it came about.



Sixty head of Jerseys graze on White Dutch, lappa clover, and Dallisgrass on this Black Belt farm. Twelve years ago this was row-crop land, and then more or less abandoned as pasture land. It was given oats for 2 years, shallow disked with 400 pounds of 0-14-10 fertilizer per acre the first year and 500 pounds of superphosphate in succeeding years. By 8:30 in the morning the cows are full and resting.

# INSTITUTE DEALT WITH ECOLOGY OF MAN

By WELLINGTON BRINK

**Y**EAR by year, we contrive to shorten a little the distance between city dweller and farmer. To do so takes harmony of thinking and understanding. It also takes some worrying and planning and working together. We now are beginning to see that there is a banker or store clerk at the end of every corn row, and that there are growing boys and girls at the end of every milk line. We can thank Friends of the Land for taking the lead in demonstrating the oneness of producer-consumer interests, and for dramatizing effectively the connection between a healthy agriculture and a healthy people.

Every summer, through a full decade, Friends of the Land has conducted a unique institute concerned with conservation, nutrition, and health. This institute has become justly famous for the skill with which it joins issues, consolidates scientific findings, and brings to its platform many of the country's foremost figures in conservation thought and inquiry.

The institute has followed a flexible and progressive pattern through the years, under the inspired leadership of Ollie E. Fink and Dr. Jonathan Forman. Its tentative beginnings were in the quiet woodland environs of Tar Hollow, Ohio. Its adventurous middle years resided in Coshocton and Athens, Ohio. But with the coming of maturity and a fuller sense of where lie its largest obligations, the institute, these last 2 years, has made its home in Chicago, that lusty mid-American metropolis where industry and agriculture meet in jovial embrace. Instantly a happy choice, the institute here commands its largest, most attentive, and most important audience. Registering for the 3-day sessions are bankers, utility executives, educators, men of medicine and manufactures, representatives of railroads and chemical companies, leaders in garden clubs and other organizations, students and housewives—all friends of the land, and actual or potential Friends of the Land. These are spokesmen for soil stewardship, key men and women of town and country who take back home for propaga-

tion the seeds of a new and needed knowledge on conservation-nutrition-health relationships.

Two highlights featured the most recent institute, June 21-23: (1) the lively discussion precipitated through papers presented by Dr. William A. Albrecht, of the University of Missouri, and Dr. Richard Bradfield, of Cornell University; and (2) the apparent impact on the medical profession in the Chicago area of papers presented by Dr. John J. Miller, of the J. B. Roerig Company, and Dr. W. F. Dove, of the University of Illinois.

Albrecht, sharing speaking duties at the dinner meeting with the celebrated Louis Bromfield, took as his topic, "Reconstructing the Soils of the World to Meet Human Needs." He outlined the possibility of providing adequate shelter, clothing, and food for an increasing population. He reasoned that chances are good for production of sufficient cellulose to meet expanding needs. He was almost equally hopeful for fibers, but emphasized that since wool is a protein product it requires productive soil. As to food, he was mildly pessimistic that reconstructed soils will be able to feed adequately the anticipated world population.

Bradfield, on a more optimistic note, stressed the need for better distribution of fertilizing materials. He indicated that many Maine potato growers are using as high as eight times the required amount of phosphorus; that in New Jersey many farmers are using at least four times the phosphorus needed. In the Middle West, the reverse often obtains.

Miller stressed the indispensability of trace elements in relation to functions performed by enzymes. He emphasized the importance of magnesium, zinc, and copper along with some of the better known trace elements such as cobalt and iodine. He presented a cancer map which pointed up a heavy incidence of the disease in the Northeastern States and California as compared with light incidence in the Southern States and most of the West.

Charles D. Jeffers, of Pennsylvania State College, aroused considerable discussion when he implied that good farms are usually found in regions where there is considerable feldspar.



Bromfield, as always, rang a response from his audience in his address on "Reconstructing the Farm to Meet Its Individual Needs." He stated that a few years ago the four brightest sons of a farmer could be expected to move to the city, leaving the less-smart son to help out on the farm; today, however, he pointed out that it is the "dumb" boy who seeks his opportunity in the city, whereas the brilliant lads know their best future is on the land.

Edward J. Condon, president of Friends of the Land, introduced the dinner speakers. The eloquent C. W. Bailey, chairman of the organization's

board of directors, was a surprise speaker at this session.

Among the speakers, also, were Garth W. Volk, Ohio State University; Paul B. Sears, Yale University; F. W. Went, California Institute of Technology; George D. Scarseth, American Farm Research Association; Ruth Griswold, University of Chicago; Faye W. Grant, Northwestern University; Ancel Keys, University of Minnesota; and Theodore W. Schultz, University of Chicago.

This institute, neatly summarized Jonathan Forman, dealt with the ecology of man—all the forces in and around man which affect his health and well-being.

## WHY I BELIEVE IN SOIL CONSERVATION

By SUSAN MYRICK



**"B**RED and bawn in de brier patch" in Baldwin County, Ga., I grew up on a plantation, land which had been in our family for more than a century, so my roots are deep in the soil. My earliest recollection is that of riding behind my father on the horse as he rode over the plantation supervising the work of Negro tenants.

I remember how my father rotated crops even in that day when Cotton was King in the South, how he read farm magazines and tried to follow "new methods" in agriculture, and how he always had a rye patch for the Jersey cow and a green range for the chickens and oats for the hogs' grazing.

But the boll weevil came, sending much of the Southland into economic chaos. I had to leave college and teach in order to save some money to go back to finish my studies.

So, my early life is tied closely to the land, and agricultural economics is something I learned the hard way. It is natural, then, that I should follow closely the story of progress on the Georgia farm and find pleasure in the improved standard of living for the farm family.

That progress, I believe, is due to a number of things: 4-H Club boys and Future Farmers of America have grown up and started farming, putting into practice some of the scientific knowledge of agriculture they have acquired; the exodus of the Negro laborer from the Georgia farms has forced the white farmer into more intensive cultivation and the use of farm machinery; and Government aids have enabled the farmer to finance his farm program.

About the time those things were happening, came the founding of the Soil Conservation Service and the soil conservation district. Farmers became conscious of the fact that Mr. Doe, a few miles down the Big Road, was producing higher yields and earning a higher income than Mr. Roe, who lived up the road a piece.

Why?

Because a "new fellow" in the county, a work unit conservationist, was helping Mr. Doe to follow a mapped plan of land use. Because Mr. Doe had planted cover crops, terraced fields, sodded waterways, followed good rotations; because Mr. Doe was a soil conservation district cooperator—a conservation farmer.

Note.—The author is associate editor of the *Macon (Ga.) Telegraph*.

So, other farmers began getting plans on their land, learning about land classes, using their acres according to their capabilities, and treating them according to their needs.

During the past 10 or 12 years in Georgia I have seen changes in agriculture that I can scarcely believe, even when I see the results. Where once were gullied, tired, run-down acres, grasses and legumes grow and herds of cattle graze; where bare soil in peach orchards once washed steadily away, pastures now flourish, the peach trees pulled up and destroyed; where cotton once followed cotton on the same acres year after year, small grains, legumes, lespedezas, and clovers are now rotated; peanut lands, once washed and depleted, are now covered each winter with blue lupine that provides nitrogen and a great load of green manure.

During the past decade, too, I have seen farmers and their families come to enjoy the comforts that the city dweller takes for granted—indoor toilets, electric stoves, bathtubs, refrigerators, washing machines. And most important of all, I have seen them acquire a new dignity and a new happiness by reason of improved economic status.

I cannot say that soil conservation alone has brought these fine things; higher prices, PMA payments, the REA, and the FHA, experiment stations with their research workers—many factors have aided the lot of the farmer. But no other one thing has made so great a contribution to his welfare as the soil conservation program.

As farm editor of the *Macon Telegraph and News*, I visit three or four farmers each week, and farmer after farmer tells me of his increased yields, more fertile lands, and better income resulting directly from his soil and water conservation farming.

How does it happen that a woman is a farm editor? Some 5 years ago, Publisher Peyton Anderson asked me what I considered the greatest service the two newspapers could render their readers. Since a large part of our circulation (about 52,000) lies in small towns and villages and rural areas, and since agriculture is the major source of income in our Middle Georgia area, we decided upon agricultural promotion. And soil conservation was the phase of better farming we decided upon as of most importance to both farm and city man.

My first enthusiasm for conservation came, I think, from reading Stuart Chase's "Rich Land Poor Land," about 1936. I have been a regular

reader of Russell Lord's *The Land* for a long time, and I was sold on conservation.

So, Publisher Anderson said for me to go to it with conservation promotion and a farm page and whatever I thought wise.

On our farm page each Sunday, and in our daily papers now and then, we tell stories of farmers who have made better yields and higher incomes because of their soil and water conservation practices; because they have put steep lands into pastures or trees, because they have rotated crops and added organic matter to the soil by the use of cover crops and litter, because they have terraced those fields which needed terraces and slowed the water down to a walk through meadow strips; because, in short, they are following the plans set down for their farming program by the Soil Conservation Service.

Publisher Anderson has encouraged the promotion in every way and allotted a generous budget for carrying it forward. The newspapers have entertained district conservationists and work unit conservationists at luncheons in order to get closer to the problem and learn more about it, and to promote the education program on conservation which we have set up for schools in our area.

Such schools as enter the contest work for points; 1,000 points out of a possible 1,500 will earn a trophy for the school. Points are awarded for seeing conservation movies, reading and discussing conservation bulletins, writing essays or poems or slogans on conservation, presenting school programs with conservation for the theme, making scrapbooks on conservation in their own communities, and interviewing farmers on conservation practices.

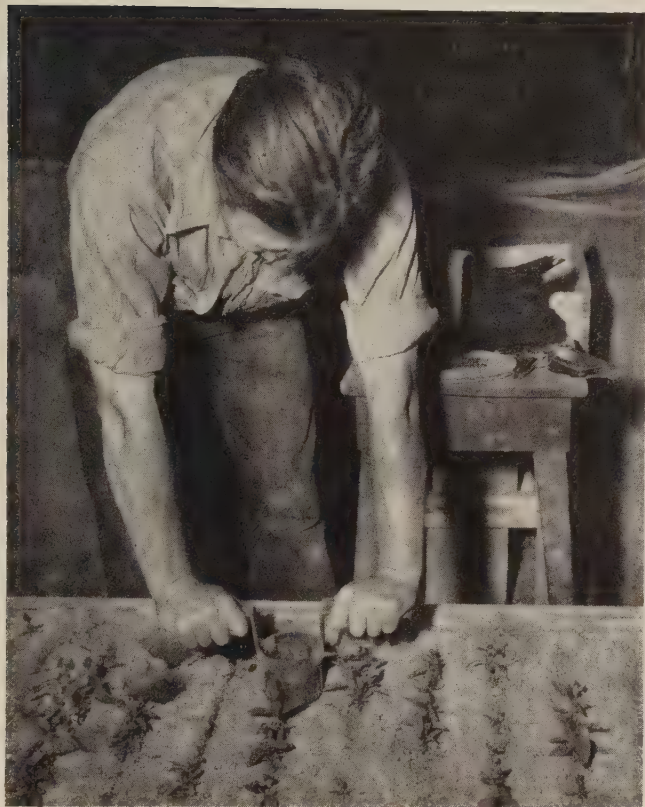
Working with the education program, I found a dearth of conservation material for school boys and girls; most bulletins are too technical for the seventh or eighth grader's understanding. I began to think of writing a textbook on conservation. Then I decided that conservation education should begin in the primary grades; so I wrote "Our Daily Bread," a third-grade social science reader with conservation as its theme. It has been adopted by Georgia and North Carolina school systems.

Yes, I believe in conservation. Fashioned of the soil, man has, through the ages, depended upon the soil for his existence. ("And God formed man of the dust of the ground.")

Conservation of soil and water is our most important duty, for soil and water and their products are vital to the survival of civilization.



# NEW NURSERY METHODS CUT COSTS IN HALF



Morris demonstrates how cylinder is pushed down around plant.

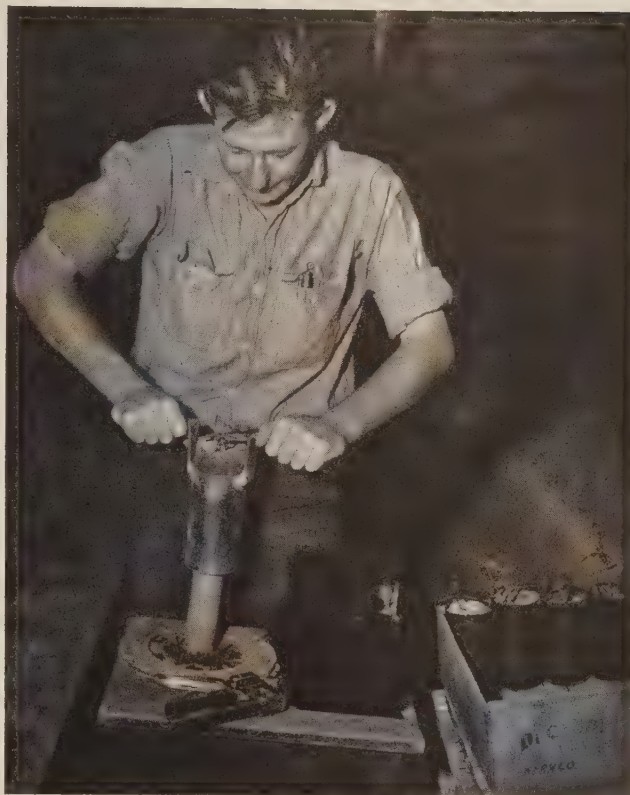
By VIRGIL S. BECK

ONE of the important projects of the SCS nursery at Tucson is the production of small trees and shrubs for use in establishing windbreaks on irrigated farms in soil conservation districts of southern and central Arizona and New Mexico.

Until a few years ago the bare-root plants were set in soil in paper pots. Because of high temperature and low humidity, mortality ran high and the cost of production was larger than at other nurseries where this type planting was used.

This problem succumbed to the ingenuity of Edward H. Morris, who is in charge of the nursery's technical operations and propagation. Production costs have declined by more than half, and two or three lots of plants now are being produced annually where one lot previously was grown. In

Note.—The author is with the regional information division, Soil Conservation Service, Albuquerque, N. Mex.



Cylinder is placed over push plug and plant ejected.



Tar paper is fastened with compression stapler.

1950 the nursery produced 40,000 trees, mainly eucalyptus, Arizona cypress, and African sumac, and several other species of trees and shrubs in smaller quantities.

What Morris did was to work out a new method of growing seedlings, and a highly efficient way to pot them.



First, he decided to employ benches rather than open beds. This was mainly because he could not lower the pH to any extent in beds. The eucalyptus seedling is unusually sensitive to alkaline conditions and satisfactory growth cannot be made if the soil has a pH much above 6.5.

By using concrete benches, Morris found that the pH can be reduced easily by using sulphur and sulphuric acid. The salts then are leached out after the soil has been treated.

Another reason for using benches is that there is less damage from insects than in open beds, and they are more easily controlled. The plants can be kept free of root-rot fungus and nematodes.

Morris says he has learned that the soil should be at least half organic matter. This aids growth and facilitates balling. Plenty of humus binds the soil together, so the balls are compact and easily handled. Morris had difficulty in getting this condition in open beds, but it is easily obtained in the benches.

It was found that the seedlings should be grown close together in the benches, a spacing of  $3\frac{1}{2}$  to 4 inches between rows being satisfactory. If they are not, several branches form near the ground and the plants do not lend themselves well to balling. Plants are balled out when they are from 4 to 8 inches high, and are grown in the balls until ready for use. Plants larger than 8 inches are very difficult to handle. They wilt easily, and, once wilted, may be lost.

Morris outlines his plant-producing system thus:

1. The concrete benches, 5 feet wide and 48 feet long, are filled with soil and compost, half and half.

2. The soil is treated with 1 pound of sulphur to 20 square feet and 1 gallon of sulphuric acid to 100 square feet.

3. Leaching. Fine sprays are used to prevent surface sealing. Water is applied for at least 24 hours to remove salts formed from the sulphuric acid.

4. The soil is allowed to dry and then the seeds are planted. Seeds are placed in a shallow trench but not covered. Sprays wash enough soil from the sides of the trench to cover the seeds.

5. Irrigations are of sufficient length to carry the water through the soil and leach out salts formed from the sulphur.

6. Fertilization starts when the plants form their first true leaves, when they are given a light application of ammonium nitrate. This is applied



Balled plants in boxes.

with a cyclone seeder immediately after irrigation. Tissue tests are run frequently and deficient minerals supplied as needed.

7. When the plants are 4 to 8 inches high, they are balled out. The plants then are kept under a fine spray for 2 days during the time the sun is shining. This permits the plants to recover from the shock of balling.

This may seem like a lot of handling, Morris admits, but points out that it is justified by the rapid growth of the plants, and that the bench system gives the possibility of three crops annually. This, he says, can be accomplished only if good seeds are used, the soil is properly prepared, and the plants are given adequate fertilizer in small doses.

In working out his system for balling the plants, Morris put in many hours of his own time studying scientific publications, and consulted with specialists of the University of Arizona.

The balling equipment, which Morris produced himself, consists of a cylinder sleeve insert,  $3\frac{1}{2}$  by 7 inches, from a 1941 Ford motor, to which two



handles of strap iron are brazed; a push plug welded to a base; small sheets of tar paper; and a compression stapler.

The soil should be moist but not wet when the balling operations are started, Morris points out. First, the balling tube is placed over the plant and shoved into the soil. A slight twist breaks the column of soil loose from the bed and the plant then can be lifted out. Next, the balling tube is placed over the push plug and the plant is ejected through the top of the cylinder.

The ball then is picked up by placing the index and second finger of the left hand straddling the plant. The ball then is tilted to the left so the fingers of the right hand can be placed underneath.

Next, the ball is laid on its side near the middle of one of the small sheets of tar paper. The edge of the paper near the person balling the plant then is rolled over the ball with the left hand. The paper is held in place on the ball while the far edge is rolled forward. This is strictly a wrapping operation and the ball is not moved during the process. Finally, the paper is stapled while the ball is on its side. The balled plants then are placed in boxes and allowed to grow to usable size. Just before shipping, the balled plants are placed in the sun so the soil will harden and make handling easier.

Morris reports that he has removed from the bed and balled as many as 240 plants an hour, and that the average laborer handles about 100 an hour.

## BUILDING UP A RUN-DOWN FARM

By A. J. TROXELL

**W**H. IRBY started with a worn-out, gullied • Crowley's Ridge farm 10 years ago. Today, the gullies have disappeared. The once-bare slopes are covered with grasses and legumes. Irby has done a thorough job of rebuilding his 344-acre farm near Rector, Ark.

The farm that Irby bought had been row-cropped a long time. The pastures provided scant forage.

Today there is a striking contrast. Seventy-five fat Herefords, one hundred sheep, and one hundred and fifty hogs graze the lush legumes and grasses. The animals don't have to *hunt* for forage—they literally *wallow* in it!

Irby was a member of the board of supervisors of the Greene County-Crowley Ridge Soil Conservation District, one of the first in Arkansas. When Clay County landowners formed a separate district in 1946, he became one of its supervisors. He still serves in that capacity.

"The first thing I did was to get Soil Conservation Service field men working with the district to prepare a complete plan for my farm," Irby remembers. "I learned that if I were going to control erosion on this land I must change from row crops to grassland.

"It took a lot of doing to bring these changes about but it has been profitable. Production has



W. H. Irby.

more than doubled, and we can increase production farther. These deep Crowley's Ridge soils respond to good treatment. By maintaining a good ground cover of permanent vegetation we keep soil losses at a minimum and allow a good portion of the water that falls on the land to stay there."

Irby gives most of the credit to Raymond Davis, a tenant who is Irby's conservation partner.

Note.—The author is district conservationist, Soil Conservation Service, Jonesboro, Ark.

Davis operates the farm, cares for livestock, grows feed crops, and shares in the profits on a 50-50 basis. Irby pays for equipment, fencing, and permanent improvements. The two share the cost of fertilizers.

Big jobs already done include the building of a mile-long diversion terrace and four stock ponds; moving dirt to fill in gullies; sodding 55 acres and seeding 10 acres to Bermuda-grass; planting 54 acres to redtop, Ladino, white clover, and hop clover. Two tons of lime and three hundred pounds of fertilizer per acre were applied on the pasture.

Irby and Davis are developing year-round grazing. They will be able to produce all of the feed required on the farm. Fescue and Ladino or white clover, supplemented by crimson clover and oats, furnish winter grazing. Bermuda-grass and Korean lespedeza, supplemented by sericea lespedeza, furnish grazing during the hot, dry weather in

July, August, and September. Cultivated land is used for silage crops and temporary winter and summer pasture.

Irby and Davis are putting all of the land to the use for which it is best suited. Eighteen acres of woodland are receiving careful management. Selective cutting, thinning, and other conservation measures assure that these acres will yield about as much net profit as the other land of the farm.

Growing all of the feed on the farm will make it possible to produce livestock at much less cost. "We want to sell at the best possible prices, but we feel that we can more nearly guarantee a profit from our efforts by keeping production costs down instead of hoping always for high prices," says Irby. "We are more interested in net profit than we are in gross income. The more conservation work we do, the more profit we make, because our soils are becoming more fertile all the time."

## PINEAPPLES, MACHINERY, AND EROSION IN HAWAII

By NORMAN K. CARLSON

**E**IGHT inches of rain in one night is not uncommon on localized areas of Molokai, nor is it unusual for ten months to go by with less than one

Note.—The author, now on military duty, wrote this while working as work unit conservationist, Soil Conservation Service, Kaunakakai, Molokai, T. H.



Pineapples are planted to follow the terraces.

inch of rain. Eight inches is too much rain for pineapplelands—the damage to plants and land is terrific. Ten months of drought will not erode the land but the harvest will be greatly reduced.

One of the problems on the pineapplelands of Molokai has been the use of rainfall. Too often the Kona rainstorms (storms brought in on southern storm fronts) come so rapidly that much of the water flows into the ocean, taking a lot of soil with it. How weird a sight, those white-tipped waves on a reddened sea along the central and western half of Molokai!

The pineapple companies are keenly aware of the erosion hazard and of the drought hazard.

Pineapples are grown from about the center to the west end of Molokai—at elevations ranging from 400 to 1,800 feet above sea level. Pineapples tend to be more acid in higher elevations. The top lands are pineapple-covered, the fringes are in range and drop to the ocean. I have often seen range land that topped the agricultural land and dumped its water on the fields; here it is the reverse—the excess water flows from the pineapplelands through the range lands and into the ocean.





Spray machine covers several rows at a time with its long arm.

There are two rain patterns on Molokai: the Kona storms and the trade rains. The Kona storms bring heavy rainstorms in from the south and they often do considerable damage. The trade rains are usually from the northeast and are relatively light; they fall throughout the year in mild showers. The Kona storms saturate the deep soils if they fall through several days; seldom do the trade rains penetrate more than an inch or two. Pineapples need an average of at least 30 inches of water per annum. Fair crops will grow with 20 inches if it is received in more than two storms.

Temperature averages about 68 degrees; there is little change throughout the year. The wind always blows—usually from the northeast.

The soil on which pineapples are grown is red, very red. The red dust gets in clothes and often stains them permanently. This volcanic soil is very deep and uniform in many places, there being very little change from surface to bedrock. In some places the pineapples are grown on shallow soils—even on soft grayish rock called paapakea; but here, they do not grow so well as on the good deep soils.

Pineapples are planted throughout the year by using slips, tops, or suckers. The crop is harvested the year round, though the bulk is ready in July

or August. Pineapples grown in the hot, dry, sunny sections taste the sweetest.

At present the pineapple is a 4-year crop and grows continuously if it has adequate moisture. It takes 14 to 22 months from the time of planting till the first crop is harvested, and usually one ratoon crop (and occasionally a second) is harvested. Plant stock produces the first crop of pineapples while each succeeding crop comes from suckers. Pineapples will produce several such ratoon crops but production drops sharply after the first, the limiting factors being insects and weeds.

The first pineapples on Molokai were in small holdings planted in 1918 at Kalae and from Wailau east to Halawa Valley. Due to undercapitalization and the business slump in the late twenties, the areas were abandoned. After 20 years we can still see the eroded rows where pineapples were planted straight up and down the steep slopes.

In 1923 Libby McNeil & Libby leased thousands of acres of land around Maunaloa at the west end of the island. Four years later California Packing Corp. came in and started large operations around Kualapuu on deep, rich, red virgin soils. In 1946 Pacific Pineapple Co. joined the group of large growers. Altogether, there are now about 17,000



acres of land in pineapples on Molokai.

The most hazardous period to the land is after the old crop is knocked down and before the new crop has become established.

On many a field there are 80 to 100 tons of green trash per acre to be knocked down and disposed of after the final harvest and before the new crop is put in. At first, the stumps and trash were burned. (Shades of a wheatfield in the Palouse!) Then, through the efforts of many, this was eliminated. The soil is plowed six to eight times before the land is ready to be planted; the bare soil, gradually deprived of organic matter, is open to heavy erosion for about a year.

*Recently, a new method has come forward to check the erosional process—the trash-mulch method. Eighty tons of trash is a lot to use. Wheat farmers growl when they have 5 tons.*

The trash-mulch method, however, not only helps reduce erosion but also knocks out a year of non-production. A 4-year cycle is cut to 3 years; that means almost continuous growing of pineapples. The land is never bare.

One of the big companies of Molokai is now using the trash-mulch method. It knocks down the 3-foot pineapple plants with a heavy cut-away disk. A short time later, the trash is used in combination with paper mulch to conserve moisture and reduce erosion.

The trash-mulch machine is mounted on a TD 18—and has more gadgets than an Army tank. On the front are two drums mounted on a turntable; these drums revolve and the teeth mounted on the bottom push the trash aside, piling it up in the rows on each side.

Then, there is a roto tiller which works up the soil. Near the roto tiller on both sides are two teeth which shoot DDT into the soil to kill nematodes and other soil organisms.

Back of this is the mulch-paper-laying gadget. The paper is laid on the new disinfected, roto-tilled, clear earth and is covered lightly on each side with dirt. Due to the incessant high winds on Molokai, a man usually follows with a hoe and makes sure the paper stays down. It is a messy looking job after the black tar paper is laid—but it will save soil and moisture.

This method serves to reduce evaporation, control weeds, and keep the soil temperature around the pineapple roots as high as possible.

After the paper is laid, the pineapple slips are planted. Slips are 12 inches apart, on both sides



**This shows how gullies occur on Molokai, where local soil and rainfall conditions create unusual erosion problems.**

of the 27-inch paper, in double rows. The paper rows are about 5 feet apart. The plantings are made in blocks of 100 to 130 feet wide and from 400 to 2,000 feet long. Once the pineapple plants are in the ground, everyone begins hoping for rain. The plants can stay alive several months without rain. As they grow, they are sprayed with iron sulphate. Iron is necessary to pineapple growth and in Hawaiian soils it is lacking in available form. The iron is taken into the plants through the leaves. Large amounts of nitrogen fertilizer are applied in either the solid or liquid form. Insecticides, selective weed killers, and hormones also are sprayed on the plants throughout the cycle. These various kinds and combinations of sprays are put on by 50-foot booms with nozzles attached, by airplanes, and by a general mist sent forth from a truck traveling roads which are spaced at 100-foot intervals. In 14 to 22 months, the first pineapples are ready for harvest, provided the rainfall has been adequate.

The blocks are 100 to 130 feet wide, with roads on each side. Down them proceed the harvesters with 50-foot booms, the pickers following behind the booms and dropping the ripe fruit on a moving belt, which carries it to a large bin on a truck holding 3½ to 4 tons of ripe fruit. The load is then hauled to sea-going barges, which take the fruit to Honolulu for processing.

Machinery and soil conservation had almost come to a parting of the ways. The first requisite was a machine for laying the paper, for putting in the



roads, and for laying out the blocks uniformly wide and with only minimum curves. The companies have tried many things. One that has worked fairly well has been the planted ditch. Through a block is dug a small ditch on grade to lead the water off to a grassed waterway, pineapples being planted through the ditch. This is not completely successful, for the pineapples on the berm dry out and the ditches often are not capable of carrying the water.

The Pacific Pineapple Co., with the help of the Molokai Soil Conservation District, tried a different approach this last year, which so far has proved successful. On steep slopes the pineapples were planted on the contour, curving around the hills. Below each strip is the road, which also serves as a water-disposal ditch. Excess water is led into grassed waterways.

We made some mistakes. One of them was in not providing enough ditches for areas with standing water; the plants rotted and died. During a heavy Kona storm of last winter (4 to 6 inches in 24 hours) there was very little erosion even though the grassed waterways were not then fully vegetated. The contoured strips allowed the water to soak into the ground. The field was formerly in grass and after only three plowings the grass roots were not all decomposed and did much to stop run-away water. At the end of this cycle the area will be trash-mulched and planted on the contour with grassed waterways. Eric Reppun, manager of Pacific Pineapple Co., was pleased and has asked the district to help him lay out his other fields.

On the same watershed, fields joining the one that was contoured lost a lot of soil in the January Kona storm. Much of this loss could have been

stopped had the fields not been laid out in long strips which disregarded the slope of the land.

The pineapple companies on Molokai are aware of soil erosion. They also know that they must continue to use large machinery. Methods for soil conservation are being worked out, and in time it is hoped that we may see a blue sea after the Kona storms.

## WHERE EVERY DROP IS PRECIOUS

THERE will be 40 percent more water for the irrigation of farms in the vicinity of Junction next year because the townspeople and eight progressive farmers have paid \$8,000 to line the ditch with concrete, according to Ambrose Dalton, a supervisor of the Piute County (Utah) Soil Conservation District.

These people have known for years that a lot of water was seeping away in the gravelly soil before reaching their farms. In 1939, before the district was organized, these farmers tried to obtain assistance through the water-facilities program of the Soil Conservation Service. An investigation by SCS technicians revealed that water was being lost through seepage all along the 5-mile ditch. They recommended that the water be piped or that the ditch be lined with concrete. Everyone needed to cooperate in bearing the expense. A few declined, so the project was delayed and water continued to seep away.

By 1948 the problem had become so serious that SCS technicians and the county agent again were consulted. It was found that about half of the water was being lost in the lower part of the ditch. The farmers called on the district to help. The problem was given first priority, and Gorden Hansen, SCS engineer, drew up detailed plans.

A contract was made with a ditch-lining concern to construct a ditch 12 inches wide at the bottom, 33 inches at the top, and with sides 15 inches high, to be lined with 4 inches of concrete.

First, the old ditch bottom was carefully shaped and reinforcing steel was placed in it. Then the machine, its bin loaded, was brought into use. As it moved forward it picked up the reinforcing steel and placed the concrete around it. Lining was accomplished at the rate of 1,000 feet a day. The contractor lined 6,450 feet of the ditch at a cost of \$1.20 a foot.

"This means that we will have 40 percent more water to mature our crops next year," says Dalton.

During the period of high water, winter and early spring, the velocity exceeds 10 feet per second



Trash-mulch machine pushing trash to either side of bed, and laying down a covering of paper.





The machine is pulled by cable and runs along iron tracks.

and a lot of gravel and rocks are carried along. The abrasive action of moving rocks would cause a lot of wear on the ditch, so during this period the water will be turned into the old channel.

“Good ditch management saves a lot of maintenance work, money, and water,” says Hansen.

In addition to lining the ditch, these farmers

have installed a water divider and constructed an overnight storage reservoir. The reservoir is being lined with bentonite, and will be used to store water at night so irrigation can be done during daytime and with a larger stream. Numerous field ditches are being relocated and land is being leveled to improve the efficiency of water use.

**MILESTONES OF PROGRESS.**—Recorded crop production on 9,348 farms in 47 States increased 35 percent after needed conservation was applied.

On farms with 80 percent of needed conservation applied, gross income was \$1,370 higher (or \$4.90 more per acre) than similar farms with only 47 percent application.

In the last decade, nearly 1,000,000 farmers and ranchers have begun operating their land under basic conservation plans, and several million more

are well along with application of practices on their land.

—R. W. ROGERS





These men spark the soil conservation district movement in Georgia. All district supervisors, they comprise the State Soil Conservation Committee: W. F. Hall, Jack Eubank, Jim L. Gillis, Jr., Z. P. Almon, and O. W. Price.



## DISTRICT SUPERVISORS IN FOREFRONT ON GEORGIA STATE COMMITTEE

By JULE G. LIDDELL

**"YOU** make the suggestions and we make the decisions," said James L. Gillis, Jr., chairman of the Georgia State Soil Conservation Committee, to members of the Advisory Committee.

The State committee does just that. The members are constantly calling for suggestions and then carefully considering each before making a decision.

Of course, the State committee members have their own ideas, and express them freely.

The State Soil Conservation Committee is set up by law and its members are appointed by the Governor. Each member must be a soil conservation district supervisor. Three of the five present members are serving as chairmen of their respective districts.

Gillis, of Soperton, is chairman of the Ochoopee River Soil Conservation District. He also is chair-

man of the legislative committee of the Georgia State Association of Soil Conservation District Supervisors, and a past president of the association. He and his brother Hugh and their father, Jim L. Gillis, Sr., make a team which operates about 20,000 acres in general farming and woodland. He has developed a farm conservation plan and is applying the principles of land capability. He is a graduate in forestry and applies the latest methods in woodland management.

W. F. Hall, of Sparta, is on the board of the Piedmont Soil Conservation District. He is area vice president of the National Association of Soil Conservation Districts, and was president of the State association when it was host to the National Association at its annual meeting in 1950. The success of the meeting was due more to his efforts than to those of any other person. Hall has developed farm conservation plans on his lands.

J. E. Eubank, chairman of the Little River Soil Conservation District, has taken the lead in local contests to intensify more interest in conservation

Note.—The author is State conservationist, Soil Conservation Service, Athens, Ga.

of soil and water. He is very active in district operations, and is applying conservation measures on his land.

O. W. Price is chairman of the Upper Ocmulgee River district and is active in its operations. He is farming his land in accordance with its capabilities.

Z. P. Almon is on the West Georgia Board of Supervisors. He lives in what has been an all-cotton section. He has taken leadership in changing to close-growing crops. He told me that this year is the first time in his life that he did not plant any cotton. One of the most outstanding shifts from row crops to close-growing crops and pasture development is taking place in west Georgia.

The State committee, composed of the foregoing men, is charged by law to pass on programs projected by soil conservation districts within the State. Helping to govern the affairs of their own districts enables these men to know what a district's plan of work should be.

Soil conservation districts are set up to enable farmers to go together and work out a plan for operation. Farmers govern these districts; hence, it was reasoned that farmer-supervisors should lead and coordinate the whole program within the State.

Advisory members are drawn from the Federal and State agricultural agencies working in Georgia. The president of the State Association of Soil Conservation District Supervisors is invited by the State committee to attend monthly meetings as an advisory member. There is always a high percentage of the advisory members present. If an agency head is prevented from attending, he usually sends a representative.

The meetings are held in different parts of the State. They may be at State experiment station sites, at Federal experiment station sites, or even at selected farms. Recently the Ocmulgee Soil Conservation District had the members as their guests for a day at Perry. The morning was spent on business matters, with all advisory members present. The afternoon was devoted to a tour of the farm of Sam Nunn, chairman of the local district, to observe conservation measures and land use.

About once a year, the committee meets at one of the 4-H Club camps. The last was at the Laura Walker State Park near Waycross, with a special group of 4-H boys and girls on wildlife conservation. The committee is alert for all activities that have to do with soil and water conservation.

Last year the committee sponsored a textbook, "Conserving Soil Resources," pointed at the

eighth-grade level for public schools in the State. They selected three authors, one each from the College of Agriculture, the State agricultural extension service, and the Soil Conservation Service. After the book was printed, the State Soil Conservation Committee, through its chairman and executive secretary, asked every district supervisor to take the lead in his county in calling on the county school superintendent to urge that copies of the book be put to work in the schools.

The committee sponsors a Soil Conservation Week, proclaimed by the Governor, every year. Last year, these were among the results:

Newspapers published 41 special editions, 767 articles, 87 editorials, 571 pictures, and 602 advertisements—all about soil conservation farming.

Radio stations presented 132 soil conservation programs.

Georgia ministers preached 274 soil conservation sermons to audiences totaling 32,121 persons.

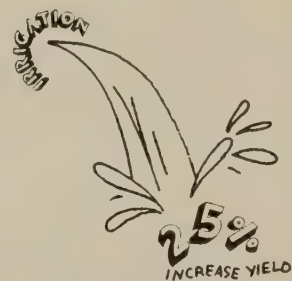
Eighty-seven tours were arranged to study the work of soil conservation district cooperators. The attendance was 3,555 persons. In addition, 55 demonstrations were attended by 4,619 persons.

Other meetings on soil conservation totaled 136, with 7,518 persons present. Civic clubs, with 2,281 members attending, had 62 soil conservation programs.

Motion pictures were shown to 266 groups, or a total of 11,103 persons.

More than 430 veterans' classes, with attendance of 9,527, had soil conservation programs.

This is the kind of results obtained when farmer-supervisors, serving as the Georgia State Soil Conservation Committee, "make the decisions."



#### **CROP PAYS FOR IRRIGATION SYSTEM.—**

Ralph Gaaney, shade tobacco grower in Grady County, Ga., and supervisor of the Flint River Soil Conservation District, reports that irrigating his tobacco last year increased his yield about 25 percent—enough to pay for the irrigation system in 1 year. He also irrigated his pasture during a fall drought, which gave him good grazing when neighboring farms had none.



## WILLING ACRES

(Continued from page 50)

the film shows that crops such as cotton, corn, and tobacco may also be produced profitably by practical land use. The story emphasizes the fact that farm women are quick to recognize what practical land use can do to bring about better living conditions for the family.

The educational message is tied together with a heart-warming story of folks in one community . . . the telephone operator who knows all and tells most of it . . . Fred Sanders, who lived on a farm and left it . . . and the girl and the farm he came back to.

**NEW EXECUTIVE SECRETARY.**—H. Wayne Pritchard will take over the duties of executive secretary of the Soil Conservation Society of America, it is announced by Morris E. Fonda, president. Pritchard will come to the Society on January 1, 1952, from the Iowa State Soil Conservation Committee where he has been the secretary for this group. The office of the Society and the new executive secretary will be located in Des Moines, Iowa.

In his new position, Pritchard will be the executive officer for the Soil Conservation Society, which numbers thousands of members in the United States, Canada, South America, and other countries. The Society's principal work is to advance the science of land use and water and soil conservation. Its members come from soil conservation interests in public, State, and Federal agricultural groups, private industry, farmers, and other individuals interested in soil and water conservation.

Born in Canada, Pritchard moved to the United States in early youth to commence a long agricultural career. After obtaining his degree in vocational education at Iowa State College, he taught vocational agriculture in Iowa for 8 years. His teaching career was interrupted by 2 years in the intelligence division of the Army Air Corps, where he served in India and the Pacific area. In 1943 Pritchard joined the State Soil Conservation Committee in Iowa as secretary, and in this work he has taken a leading part in soil conservation in Iowa and throughout the Midwest.

In addition to his career in agriculture, Pritchard has a background of farm experience. In 1949 he was selected Honorary Iowa Farmer by the State Future Farmers of America organization. He has served as president of the Iowa Vocational Association and vice president of the Iowa Vocational Agriculture Teachers Association.

**SONG OF SOIL.**—Ernest D. Walker, extension soil conservationist at Urbana, Ill., is one of the poet laureates of the land revolution. He is also the

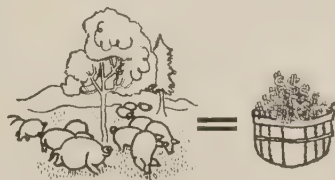
valued bass of a barber-shop quartette, "The Tune Tinkers." His combination of interests and attributes resulted in his composing "A Conservation Song" (sung to an arrangement of the well-known "Old MacDonald Had a Farm"), which was on the program of the annual meeting of Illinois district supervisors in 1948, has been used since then by other groups, and has also been recorded for phonograph and radio production.

**YOUNG WINNER.**—Honors are piling on Bruce Ketch of Bath, Steuben County, N. Y., as a result of his being one of the national winners in the 4-H soil and water conservation contest. Nationally, he received a scholarship valued at \$300. Here he is receiving from Carl Wellington, Steuben County Soil Conservation District treasurer, the certificate indicating his national achievement. Additionally, he received a gold wrist watch (on the table) as the emblem of his State victory. As sectional winner, he received an all-expense paid trip to the National 4-H Club Congress.



**HIGH RETURNS FROM GRASS.**—J. S. Lay, of Oconee County, S. C., fed his hogs dry lot in 1948. The return was approximately 12 pounds of meat per bushel of corn fed to feeder hogs. Pig litters averaged 6.2 per sow on pigs raised.

In 1949 Lay grazed all his hogs. They were permitted to range on all the fescue and clover pasture they wished, grazing mainly on Ladino clover. Records were kept on 20 feeders that were marketed, to learn if grazing paid. Lay got 20 pounds of meat per bushel. He had fewer pig losses; 7.5 pigs were raised per sow.





**CONSERVATION VALLEY.**—In 1933 Baker Valley in Allegany County, N. Y., was about ready to go back to the Indians. Of 1,983 watershed acres, 1,600 formerly in forest had been cleared for pasture and crops. Erosion, gullyng, stream-bank cutting, and flooding were in high gear.

Probably the Indians would have refused to take it back at that time. This year, however, I don't doubt that they would jump at the chance. But, with all the improvements, it is unlikely they would recognize their old hunting grounds.



Strip cropping, and diversions 225 feet apart, on the L. N. Watson farm, West Almond, N. Y.

There are six brand-new ponds, installed by SCS technicians and the State Division of Lands and Forests. There are two other ponds built and "owned" by Nature's own conservationists, the beavers—here through courtesy of the New York Fish and Game Department. All the ponds now help control floods, furnish fire protection and recreation, and serve farm uses.

That is only one phase of the complete watershed conservation program that makes Baker Valley a model. The whole area has been protected by reforestation and conservation cropping systems. On the 12 private holdings, each in the Allegany County Soil Conservation District, pastures have been improved with better legume seedings. About 500 acres of woods have been fenced off from grazing. Six hundred acres have been reforested. Over 200 cropped acres are now on contour, in strips with diversions, terraces, and other soil-saving practices.

State and Federal agencies have worked hand-in-glove with farmers and sportsmen. Future Farmers and 4-H Club members and their teachers worked on tree planting. Several conservation field days, sponsored by the extension service, the Farm Bureau, and the Production and Marketing Administration, helped get the job done. Essential financing was aided by Pittman-Robertson wildlife-restoration funds made available by the State Conservation Department.

The results of the united efforts are right where you can put your finger on them. Ponds have retarded the flow of millions of gallons of spring runoff waters. Flood peaks have been reduced by vegetative cover and other practices. Stream banks have held firm. One stream that used to go dry held water right through the droughty summer of 1949; other streams have maintained more stable water levels. Pond levels have been steadier. Wild game and fish are returning to the area.

One of the landowners, Lynn Watson, donated 10 acres of his property to the Belmont Conservation Club. This game-management area now features a complete conservation program on what was originally thorn-brush pasture. A 1½-acre pond built by SCS technicians has been stocked with an experimental variety of fish. The adjoining area has been reforested and planted with shrubs affording game cover and food. The Allegany Federation of Sportsmen's Clubs uses the spot as a showcase of recommended wildlife conservation measures.

What has been done in the past 18 years amounts to an 80 percent change in land use for the watershed. And the principle followed was the tried and true—"each acre according to its capability." Anyone looking for a nearly perfect example of how men and natural resources can get together would do well to study Baker Valley.

It's Conservation Valley, now.

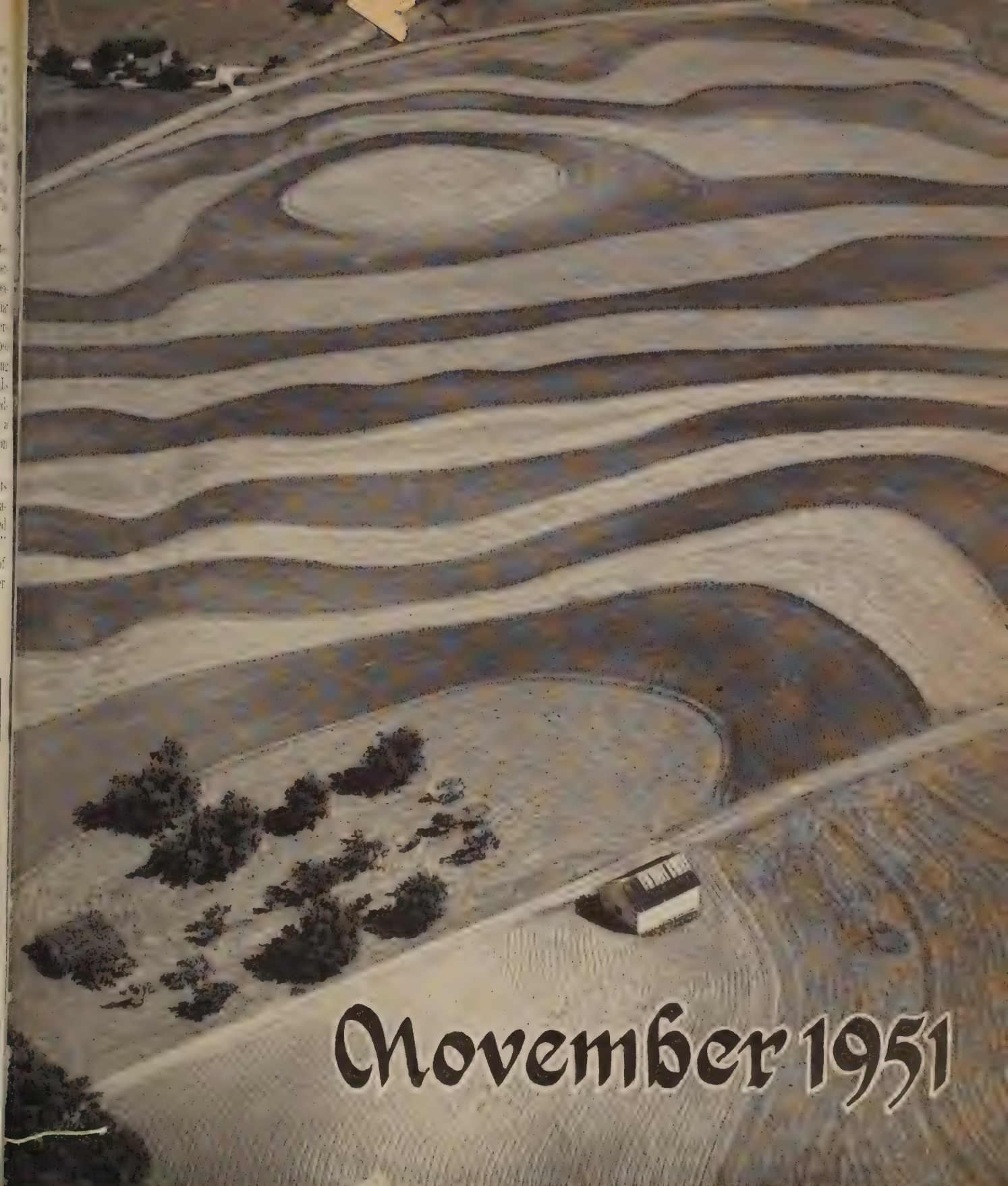
—ROBERT A. REED



Farm pond and reforestation area. The island is for protection of nesting ducks.

**NOW IS THE TIME.**—It is not too early to make up that Christmas list of subscriptions to **SOIL CONSERVATION Magazine**. Send names and addresses of good friends, and check to cover, at only \$1.25 each, to Superintendent of Documents, Government Printing Office, Washington 25, D. C.





November 1951

# Soil Conservation

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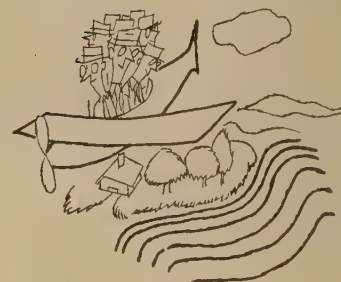
# SOIL CONSERVATION •

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CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE  
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Editor

Art Work by

**W. HOWARD MARTIN**

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**FLYING TEACHERS.**—An air tour of the Clay County Soil Conservation District climaxed the conservation workshop for teachers held at Liberty, Mo. Eleven teachers, with an average of over 14 years of experience, took the course, which was sponsored by the district. The workshop was conducted at Liberty High School by the Northwest Missouri State Teachers College. The teachers had 6 hours a day of class and field work for 13 days. The college allowed two and a half credit hours for the work. The farms of the district cooperators were used as a laboratory. A. R. Mottesheard directed the workshop.

Cooperating in the course were representatives of the Soil Conservation Service, Extension Service, Production and Marketing Administration, and State Conservation Commission. Donald Pharis, Liberty, is chairman of the board of supervisors.

(Continued on page 95)



**FRONT COVER.**—This magnificent photograph by John W. Busch goes with Barrington King's article in this issue, "Soil Conservation Forges Ahead in the Southeast." It shows 4-year strip rotation of cotton followed by wheat and lespedeza on the farm of A. N. and Sam T. Means, in the Poplar Springs, S. C., community.





Here the swollen Kaw took a vicious bite out of the rich farm land of Fred Grobe, in Douglas County.

# THE COMPLETE WATERSHED PROGRAM IN FLOOD CONTROL

By **HUGH BENNETT**  
Chief, Soil Conservation Service

**I**T IS a real inspiration to me as a soil conservationist to meet with you newspaper editors assembled here in Lincoln to consider the critical problem of flood control. It is a significant milestone, I think, in the Nation's march toward preserving its basic soil and water resources, when several hundred busy editors come together on their own initiative and at their own expense to discuss ways of achieving sound and effective flood control in this breadbasket of the Nation.

The recent flood catastrophe in Kansas and neighboring States has once more focused attention on the urgent need for doing the best we know how to prevent the recurrence of disastrous floods which every year somewhere in this area, as well as in other parts of this country, tear down with great destructiveness across productive farm land and through prosperous towns and cities. The effects of floods are very real to you people right here in Lincoln and throughout southeastern Nebraska after your experiences of May and June last year, and again this year.

What can be done—what must be done—to prevent the staggering losses in crops, in property, and even human life depends in large degree on the de-

termination and efforts of you people who are in this audience today.

Some among you may feel that we cannot afford the cost of flood control in these times of national emergency. As a civil servant, I did not come here to tell you what the Nation's policy should be in this regard. That is for you, the people, to say. But there are some things I can tell you.

First, the rivers out here did not wait until we had settled our score with the Communists before they decided to go on a rampage. We hope that neither we nor our children will live to see another



Once a comfortable farm home, now a shambles. The author sadly ponders the wreckage and the greater tragedy of which it is a part.

Note.—Dr. Bennett delivered this address at the Newspaper Editors' Flood Control Meeting, Lincoln, Nebr., August 11, 1951.



catastrophe like this last flood. But, unfortunately, we can be certain that, emergency or no emergency, costly floods in all probability will strike again next year, and the next—somewhere in Nebraska, Iowa, Kansas, Missouri, or other parts of the Nation.

Secondly, I can tell you that it is possible to control these floods. It is possible to eliminate almost completely the smaller and more localized floods, and it is practicable also to reduce greatly the damages from tremendous rainstorms that cause super floods like this last one.

No single method of flood control, however, will do the whole job. We have seen in this great flood, for example, how levees high enough to have withstood the largest previous floods of record were overtopped. On the other hand, we have also seen how the soils of our fields and pasture lands became so saturated with water after 2 months of heavy rains that they could absorb very little more from the final big rain. No, to meet all kinds of flood conditions, and to prevent or minimize flood damages wherever they occur, we must use every available method of control that we know about.

We must develop a sound, coordinated plan for every watershed to assure a properly balanced and truly effective attack directed toward prevention of flood damages. The day of piecemeal flood control—where only a part of the damage in a watershed is considered—is rapidly drawing to a close.

Our efforts to control floods must begin where the rain strikes the ground. Every additional gallon of water that we can get into the soil by improving its intake capacity with conservation measures means 1 gallon less contributed to the flood flow. Let no one mislead you into believing that it is ever impossible to get more of the rain into the soil. No matter how much rain has already fallen, we have yet to find a soil on sloping land that does not have some water-holding capacity left. In other words, a soil is never completely saturated unless it is below the ground-water table, as in a swamp. Water will still go in along roots, and will penetrate through cracks in the ice of so-called "frozen soil." It is true that when the soil is comparatively dry it can take up many times as much water as it can after prolonged rains. But it is also a mathematical certainty that the soil can always take up some more water. Therefore, our first step in flood prevention, under all conditions, is to put the soil, as far as practicable, in a condition conducive to optimum water intake.

What excess water does run off the fields into the drainageways, we must slow down with small retarding structures and with other improvements in the watercourses. And what flows out of the creeks we will have to handle in the main river valleys by more imposing measures—engineering measures such as reservoirs and levees.

Our job of flood control, then, begins where the raindrop falls and it does not end until the water reaches the ocean.

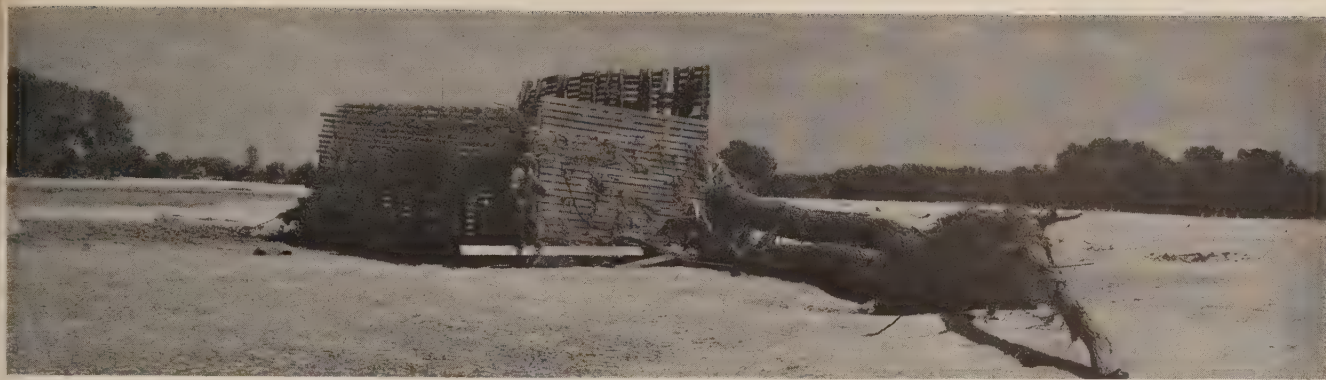
The important problem now confronting all of us is to determine, in cooperation with each other, what kinds and combinations of measures are needed, watershed by watershed, to accomplish the most effective flood control we can afford. In doing so we must, of course, bear in mind our continuing need for irrigation storage, for power production, for municipal water supply, for pollution abatement, for preserving fish and wildlife resources, and especially the need for maintaining maximum agricultural production on fertile valley lands. Our watershed plans must provide not only for the control of floodwaters, but also for their conservation for beneficial use. In this connection, let us bear in mind that the limited number of available sites for larger reservoirs should, wherever possible, be considered with respect to multiple land and water needs before they are dedicated solely to flood control.

There are several reasons why sound and enduring flood control, aimed to benefit all the people,



This city bus rode 500 yards down the raging Kaw, ending its journey in a mad chaos of water, mud, and debris.





**This corncrib floated in from another county, and now stands sentinel on a sanded area that formerly was a leading corn-producer in Kansas.**

can be achieved only through a coordinated attack. The first of these reasons is apparent from the distribution of flood damages. Although some engineers may dispute what I say—and might even quote Webster against me—I submit that flood damages begin where the rain falls, regardless of what Webster may have thought about it. The crops on upland farms that are swept down by storms which cause great floods are just as truly lost as the crops on overflowed land in the valleys below. The soil washed off upland fields reduces the productivity of the land just as much as does deposition of soil by the water flooding over agricultural bottom lands along the rivers. Floodwater damages to agricultural lands in thousands of miles of small creek bottoms throughout our watersheds represent just as much loss per acre as flooding of the wide Missouri River Valley between Kansas City and St. Louis.

The Soil Conservation Service has just completed a preliminary survey of the storm and flood damages in Kansas and Nebraska during July. This is what we found: Losses of crops on upland farms amounted to approximately \$110,000,000. Losses of irreplaceable topsoil, the thin and fertile layer that sustains agriculture in this granary of the Nation, has been estimated at \$200,000,000. This figure is based on the differences we have found in crop yields with different depths of topsoil. Losses from floodwater and sediment in the creek bottoms and small stream valleys, above the points where anyone has yet proposed specific flood-protection measures, were estimated at \$102,000,000. The total of these three figures is \$412,000,000. Additional losses in Missouri, Oklahoma, Iowa, Illinois, and other neighboring States would bring the total probably to well over a half billion dollars in the one month of July.

Without in any way minimizing the staggering losses at Kansas City and along the major river valleys, we believe that these astounding damages along the tributaries are convincing evidence that a flood-control program aimed only at downstream cities and river bottoms is only a partial flood-control program and not one designed to benefit all the people who have suffered losses.

Let me give you another reason why this country needs a coordinated and complete flood-control program extending to every acre all the way down to the sea. To be sure, super floods like this last one are comparatively rare events. I am told that the flood discharge at Kansas City far exceeded the highest ever previously experienced, which was back in 1844. When an event exceeds all previous expectations and wreaks such havoc, it not only makes banner headlines, but it becomes an historic classic. It gets into our memories and textbooks. People come to look on it as characteristic rather than something rare—or unique. Actually, if one spreads the enormous damage caused by this flood over all the years between such rare events, the average annual loss is considerably less than the damages from all the smaller local floods that occur year after year in the smaller watersheds throughout Kansas, Nebraska, Missouri, Oklahoma, Iowa, and Illinois. A typical example of the smaller, more frequent floods has occurred here on Salt Creek these last 2 years. You local people are only too familiar with this kind of flood.

Our surveys show that 75 percent of our average annual flood loss has occurred above the main river valleys and large cities. This, of course, is due in no small measure to the fact that a substantial part of our major river flood plains and cities are already protected by levees and major reservoirs, for which credit is due primarily to the

effective work of the Army's Corps of Engineers.

I can give you still other reasons why a coordinated approach to flood control is essential. Soil erosion on watershed lands must be brought under control to protect downstream flood-control works. We must control erosion to protect our flood-control reservoirs from rapid silting and loss of effectiveness. We must control erosion to prevent the silting of stream channels, which further reduces their flood-containing capacity. We must control erosion, moreover, to prevent overwash of infertile sand and poor subsoil material on our productive bottom lands. But even more important than all of these, we must control soil erosion if we are to maintain the base for our agriculture, our national strength and defense, and, indeed, to prevent our civilization going the way of many great nations of the past which failed to take care of their agricultural land.

So that there may be no mistake about where we stand in the Soil Conservation Service, let me reaffirm:

1. That we believe, and our widely multiplied experience confirms, that flood control is a job which begins where the rains fall and the runoff starts—that is, in the fields and pastures and forests, and ends only when the runoff has safely reached the ocean.

2. That we believe wholeheartedly in coordinated planning and treatment of entire watersheds and drainage basins in cooperation with the Army Corps of Engineers, with soil conservation districts, with watershed associations, and with all other Federal, State, and local agencies that have a responsibility in land and water management.

3. That the work of the Soil Conservation Service is in the fields and pastures and wood lots and on the upstream tributaries of the major rivers. Our job is first to assist landowners and operators to use their land within its capability, and to treat it with sound conservation practices in accordance with its needs. Beyond this, our job is to assist organizations of local people to install upstream flood-prevention measures, such as small retarding structures, gully plugs, and channel improvements. If, through such a program, we can cause the water which falls on the lands in the upper watersheds, or even a considerable part of it, to delay its race to the sea, we have by that action won part of our objective—completed part of the job of flood control.

But this kind of program alone will not prevent flooding of the main river valleys and the cities in them.

I understand that some of your local papers have editorially attributed to soil conservationists claims to the effect that the amount of money spent on large flood-control reservoirs would, if spent in the watersheds, dry up the rivers. Well, I don't believe any employee of the Soil Conservation Service ever thinkingly made such a statement. If he did, I repudiate it here and now. In my opinion additional controls such as reservoirs, levees, and other main channel protective works will be needed to safeguard the flood plains of our major rivers against such disasters as we have just experienced. This trunk channel job is the responsibility of the Corps of Engineers, which has ably fulfilled its part of the job for more than a century.

4. We believe that coordination of the river-control and watershed programs was the intent of Congress when it passed the Flood Control Act of 1936. We believe it is still the intent of Congress. We do not believe that Congress intended one program to be in any sense a substitute for the other, but rather that they should be complementary parts of a single job.

The Flood Control Act of 1936 and subsequent acts provide all the authority needed by the Department of Agriculture and the Corps of Engineers to work together in planning and carrying out a complete program for alleviating flood damages and conserving soil and water resources. Such watershed and river-basin plans for flood control, as we see it, involve three principal types of operations, namely:

- (1) *Land treatment.* Our conservation farm and ranch planning is based on the principle of treating every acre of land according to its need, and using each acre according to its capabilities (that is, for cultivated crops, grass, timber, or wildlife). It also includes safe and orderly disposal of runoff water originating on the farm or ranch. Land-treatment measures prevent erosion, maintain soil fertility, conserve water by storing it in the soil, prevent damage on the farm from the erosive action of rainfall and runoff, and reduce the sediment loads of creeks and rivers. Land-treatment measures are now being rapidly installed by landowners throughout this area—as well as other areas—under the programs of the locally organized soil conservation districts, aided by technical assistance



from the Soil Conservation Service and by other forms of assistance, such as educational and financial. We have ample authority for this part of the program, but funds available for technical assistance fall far short of the need, if we expect to achieve substantial flood protection in the next 10 or 15 years.



Highways were undermined and washed out, fences and power lines destroyed. In the background, here in Douglas County, a sheet of sand was deposited.

(2) *Upstream engineering* for water-flow retardation and channel stabilization. This phase of the watershed plan involves work on the tributaries and waterways to control or retard runoff from neighboring farms. These measures alleviate damage to the agriculture of the smaller watersheds above the downstream engineering works. They slow runoff and stabilize sources of sediment in upstream channels.

We are doing these things now just as rapidly as our facilities permit. They represent water-control operations over and above what is ordinarily done through the farm-land conservation job.

(3) *Downstream engineering* for flood control. This comprises the work done on the major waterways to control runoff after it has reached the main stream. It alleviates urban damages and damage to agriculture in the flood plains lower down the major rivers. This major engineering is the responsibility of the Corps of Engineers.

There you have, as we understand it, a coordinated approach to flood prevention and control—a program that protects the farmer or rancher of the

uplands as well as of the lowlands, while protecting the cities, too.

Congress has so far authorized watershed programs, including land treatment and upstream engineering, on 11 watersheds in different parts of the country. Many of you no doubt are acquainted with the work under way on the Little Sioux watershed of northwestern Iowa, and the Washita River of Oklahoma. We are carrying out the works of improvement in these two flood-control projects—as in the other nine—primarily through the farmers' soil conservation districts. In all instances our work is coordinated with the authorized work of the Army Engineers farther downstream.

We need go no farther than the city limits of Lincoln—into the Salt-Wahoo watershed—to find what is to my mind a splendid example of the coordinated watershed approach to flood control. Here is a striking illustration of effective community cooperation, including the Salt-Wahoo Watershed Association, which is made up of city people and farmers in soil conservation districts; the Soil Conservation Service; the Army Engineers; and other local, State, and Federal agencies.

Joint studies of this watershed are being made now by our Service and the Army Engineers under authority of the Flood Control Act of 1936. We hope that this study will lead to authorization of a coordinated program for flood control in this area similar to that already authorized in the 11 other watersheds mentioned. I think the soundness of this cooperative approach was well stated in the progress report on the joint watershed survey made by the Army Engineers and Soil Conservation Service. The report pointed out that the two agencies had one objective in this study—that is, to prepare an over-all plan for the entire watershed which, quoting from the report, “will represent from the standpoint of both agencies the best plan for the basin as a whole which is practicable within the limits of economic feasibility, and one which both agencies can recommend and support without reservation.”

“Both agencies feel,” the report added, “that this objective can best be realized by a joint study which will produce a single plan mutually developed by both agencies rather than a compromise between two individual plans developed by the two agencies acting independently.”

The Salt-Wahoo undertaking also illustrates the importance and effectiveness of local group action

in watershed planning and development. Here, as elsewhere, the local soil conservation districts are taking an important part in the permanent watershed program. As the principal organization through which soil and water conservation measures are being applied to the land by individual farmers the country over, it is only logical that these districts also should be called on to serve directly in such flood-control activities in the public interest.

By the same token, the Salt-Wahoo situation shows why there is a place for an advisory group, committee, or association like the Salt-Wahoo Watershed Association, which brings together the interests of farmers and city people. In other words, for a watershed-development program to operate successfully—in Nebraska, in Kansas, or anywhere else—the basic responsibility for that program must involve the people residing in the watershed. That means there must be a local responsible organization such as a soil conservation district, watershed association, or flood-control district, which is representative of all the interests in the watershed and which can act to coordinate the activities and services of all agencies and interests to formulate the necessary broad, flexible program for watershed development and protection.

We have found that the most efficient way of carrying the soil and water conservation job beyond the planning stage anywhere is through coordinated group action of the landowners and operators—with technical and other assistance from other sources. Group action is especially effective, and necessary, in dealing with problems of watershed extent. Soil conservation districts themselves, of course, are basically group-action devices; and their efficiency and success in this direction have



High ridges of flood-deposited soil material, scraped off Highway 24 in Douglas County; considerable floodwater was still trapped.

been proved by their rapid organization and growth. In only 14 years, approximately 2,350 such districts have been formed in the 48 States, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. They now include more than four-fifths of the farms and ranches in the United States and three-fourths of the country's farm land. Fortunately, the area you editors represent is largely within soil conservation districts. Nebraska, for example, is one of 10 States completely covered by soil conservation districts. Kansas is not far behind with more than 99 percent of its area in districts; while Iowa is 95½ percent covered. If your county doesn't yet have a district, I recommend that you urge the local people to organize one.

Let me emphasize, however, that planning and application of the watershed program requires special technical skills. Downstream, as you know, the highest order of engineering skill is necessary for building big dams, main-channel stabilization works, and so on. Also, in the uplands technical know-how is required to plan and apply sound land treatment and upstream engineering measures. Such plans must be based on painstaking research and on wide practical experience. They must take into account the principles of hydrology, engineering, agronomy, land science, forestry, biology, and other related fields. Under varying conditions of climate, topography, and drainage, the wrong thing done, or the right thing left undone, on any part of a farm can do serious injury.

In no event can this watershed planning and treatment be accomplished overnight by some magic formula, although it takes heavy rains and excessive runoff only a few days, or even hours, to do irreparable damage to watershed land and property. Our conservation land-treatment and upstream-engineering activities are based, in the first place, on detailed land-capability surveys. They show, acre by acre, the needs and capabilities of the land in relation to combinations of such factors as soil, slope, rainfall, erosion, and so on. Our watershed plans involve the location of sites for small floodwater retarding structures, water-disposal systems, gully-control structures, stream-bank stabilization, and other upstream-engineering measures.

Our Soil Conservation Service technicians work out on the land cooperatively with farmers, covering entire farms, acre by acre, and field by field. We cannot depend on windshield surveys and office





**This terraced slope, about 6 miles east of Richmond, Kans., held its own against the wrath of the Osage River flood. There was terrific erosion in the uplands where the land was not under the protection of soil conservation.**

planning in doing a job of the complexity and magnitude of safeguarding the farm lands of the Nation. Nor can we have a ready-made plan including a fixed set of practices to slap on any farm or watershed. Land, and the behavior of the water that falls on the land, differs from watershed to watershed, from farm to farm, and from acre to acre. So every watershed and each parcel of land must be dealt with individually.

That, briefly, is how we go about the treatment of agricultural land for effective soil conservation and flood control. We have developed a unique combination of soil conservation, engineering, and vegetative practices designed to dispose of surplus water safely while making the best practical use of the water that otherwise would be wasted. For the first time in history, we are going into the small watersheds to do everything possible to provide relief from recurring flood damages.

Splendid examples of the effectiveness of tributary stream flood control can be cited from the experience of the Soil Conservation Service.

On May 16, this year, Sandstone Creek with a watershed of 65,000 acres, southeast of Cheyenne, Okla., had  $4\frac{1}{2}$  inches of rainfall. The watershed

had been treated for soil conservation and flood control. The runoff water did not even come up to the draw-down pipes in the retarding dams. None of the permanent pools were filled. Sandstone Creek, which had been noted for its flooding, contributed practically no flow to the Washita River, while other similar creeks of the locality were flooding and doing great damage.

Farther west, near Clinton, during the same wet period, the Barnitz Creek watershed received about 13 inches of rain within 24 hours. Within its watershed of 4,000 acres four detention structures had been built and the usual surface treatment of terracing, regrassing, contouring, and the like had been completed. The creek stayed within its banks while similar neighboring creeks did great damage with this same precipitation.

Rates of silting have been measured two or three times in some reservoirs—first, before any conservation work was done on their watersheds and again after a substantial part of the needed conservation measures had been applied. Treatment of about 30 percent of the watershed resulted in a 24-percent reduction in the silting rate of the municipal reservoir at High Point, N. C.



In contrast, it was found that more intensive use of land for row crops and lack of conservation measures caused an increase of 20 percent in the silting rate of the water-supply reservoir at Decatur, Ill.

In conclusion, let me assure you that with whatever resources we are provided the Soil Conservation Service will continue to work toward sound soil conservation, wise land use, and protection of the Nation's water resources as well as its land. We will do this in cooperation with local, State, and Federal agencies, or with any other organizations and groups which have like objectives. In working toward the permanent solution of our water problems, the Service will continue to give full consideration to all beneficial water uses, including those for recreation and wildlife. Also, the Service will continue to encourage conservation districts and other conservation organizations to use, to the fullest extent practicable, all available assistance from public and private sources.

Our men throughout the field are acquainted with the principles I have mentioned and I am sure you may count on their living up to them to the fullest possible extent. We will actively cooperate with soil conservation districts and other similar groups. This, together with the positive support of agencies and community leaders like those represented here, who are in a position to help, will expedite the conservation program throughout the country.

We have the knowledge of how to do the job; the conservation tools have been perfected and tested; we have an organization equipped not only with the necessary technical skills, but with the knowledge and understanding to work with local people—individual farmers, community groups, organized districts and associations, city people, and in-



Harvest this year will be zero from this field, which normally produces 80 to 100 bushels of corn per acre. It is near Lawrence, Kans.



Edge of 3-foot sand deposit on farm of F. V. Lewis, several miles northwest of Lawrence. This stretch, at depths of 6 to 36 inches, covered about 200 acres on this and four adjoining farms. It is clean, water-assorted sand of low fertility. Some of the land can be improved by plowing up the darker-colored, rich, alluvial material and mixing it with the covering sand. Some of the thicker deposits of sand may need to be dumped into nearby depressions.

dustries as well. As a Nation we have no excuse for not doing the job of conserving our basic soil and water resources; indeed we dare not shirk it, because our individual and national security, peace, and prosperity depend on it.

**WOMEN TAKE A HAND.**—Soil conservation is no longer—if it ever was—a stag party. At the annual convention of the Minnesota Association of Soil Conservation Supervisors at Winona last February, the ladies almost took over.

Mrs. Koren Johnson of Albert Lea was there to tell the conference about the Daughters of the Soil, a new auxiliary which has been doing a splendid educational job in Freeborn County.

Mrs. M. M. Hargraves, then State president of the League of Women Voters, urged wives of supervisors to participate wholeheartedly not only in soil problems but in all public questions.

Mrs. Doris Wyman, State extension worker, gave a splendid talk on women's activities in agriculture.

A large number of supervisors brought their wives to the meeting and that accounted in large part for the success of the Winona gathering.

—FROM *The Minneapolis Star and Tribune*

**TACKLING DOWN THE ROADSIDE.**—The Limestone Valley (Ga.) Soil Conservation District has entered into a memorandum of understanding with the Georgia Highway Board whereby State highway rights-of-way through the district will be vegetated. The memorandum provides that appropriate types of vegetation required in different locations will be used to control erosion and to beautify the rights-of-way.



Completed pond of J. A. Harmon provides recreation as by-product of good land use.



## SOIL CONSERVATION FORGES AHEAD IN THE SOUTHEAST

By BARRINGTON KING

**R**EVOLUTIONS—even in far-away places—are usually accompanied by screaming headlines in our newspapers. But a revolution has been going on throughout southeastern United States for 18 years that a lot of people right in the midst of it don't even know about.

To be sure, it's a revolution on the land—a change in land use, farming methods, crops, and the attitude of the people toward their stewardship of the land. And it is being carried out through democratic processes in local soil conservation districts. But in the final analysis, its effect on the economy of the region—on its farming, its business, its schools, its churches, its homes, and the health and happiness of its people—may be much more far-reaching than many revolutions that are heralded with blaring headlines.

George DePass, Spartanburg, S. C., attorney, who operates a Hereford cattle farm, recently referred to the work the Soil Conservation Service has done in the area as “the greatest revolution in the economy of the South since Eli Whitney invented the cotton gin.”

“The Soil Conservation Service came along at a crucial time in the life of this section,” DePass

said. “Our land was worn out with cotton farming, but it responds wonderfully to grass.”

There is hardly a community in the Southeast that hasn't felt the revitalizing effect of this revolutionary ferment. You can pin point these communities in every State and in almost every county in the Southeast. But let's take a look at two typical communities in the part of the Southeast where the revolution began in 1933 with a demonstration on the land of a radically new approach to agricultural problems, based on the simple principle of using land within its capabilities and according to its needs.

The Poplar Springs community in Spartanburg County and the Fork Shoals Road community in Greenville County are located in the Piedmont area, where one of the first erosion-control demonstrations of the Soil Conservation Service was set up. The area was selected because of the severe erosion that had occurred during more than 100 years of row-crop farming, when cotton and corn were grown year after year on the same sloping land and gullies were accepted as the natural result of cultivating the soil.

It's a different story today. The land is covered with a blanket of green. Grasses and legumes that

Note.—The author is chief, regional division of information, Soil Conservation Service, Spartanburg, S. C.



Before the arrival of conservation at Poplar Springs the Berry Gully was one of the depressing "sights."

had never even been heard of by most of the farmers 15 years ago are discussed with easy familiarity in ordinary conversation. Suiter's grass (tall fescue), sericea lespedeza, kudzu, Caley-peas, Ladino clover, reseeding crimson clover, orchard-grass, and many other plants adapted to varying conditions have completely transformed the appearance of the land—actually resurrected it from a condition of essential abandonment.

Farmers still grow cotton and corn in these communities. But they're not satisfied with a half bale of cotton and 15 or 20 bushels of corn to the acre. They grow their cotton and corn in systematic contour strip rotations and are getting a bale to a bale and a half of cotton and 60 to 100 bushels of corn to the acre. They are getting larger total yields on fewer acres and they're using their other lands more and more for pasture and hay. Moreover, seed of soil-conserving grasses and legumes have become an important cash crop in the rapidly expanding soil and water conservation program.

The momentum of soil conservation has increased tremendously in the last few years. It's not only farmers who are talking about the land in new terms. The merchants, the bankers, the lawyers, are thinking about the land in new terms too. Many of them are buying land and developing it for cattle. Rural ministers are preaching soil conservation from their pulpits. Courses in soil conservation are taught in urban as well as rural schools.

W. D. Buffalo, manager of the Security Seed and Feed Co. at Greenville, S. C., said, "Grass-seed sales alone have turned this business from an unprofitable to a profitable undertaking.

"When I came here 5 years ago, we were buying Ladino clover seed in 25-pound lots. This year we have unloaded 40,000 pounds of Ladino clover seed. During the same period, production of tall fescue seed has gone from nothing to 123,000 pounds, sericea from 100 or so pounds to 30,000 pounds, and ryegrass from 15,000 to 220,000 pounds.

"Granade (H. Granade, SCS work unit technician in Greenville County) and his group have been almost entirely responsible for this spread of grass in our county. It's like building a house. You have to build it before you can live in it. We've reached the stage of living in it now."

Charles Kellett, who operates a general store in the Fork Shoals Road community, started a seed-cleaning plant in 1947. Last year he cleaned 50,000 pounds of fescue seed alone. This year he expects to handle a lot more than that. Business was brisk at the store, too, and Kellett answered questions while he made change for his customers.

How much business did he do in the seed-cleaning plant? Kellett went to the safe and got out a copy of his income-tax report, while his wife waited on the customers. The report showed that he had collected \$4,936.20 on his seed-cleaning operations. So Uncle Sam made a profit on the seed business too.

"It looks as if people are in this new kind of farming to stay," Kellett said in explaining how he happened to get into seed cleaning. "They were having to carry their seed away for cleaning, so I figured I might as well get in on the deal."

As Charles Kellett went back to his customers at the front of the store, his father, W. M. Kellett, leaned back in his chair and continued the conversation. "What really started the whole thing," he said, "was this SCS fellow Granade. He came out here and showed the people all the different kinds of grasses they could plant. He's the one who is responsible for it in this section."

Kellett's father and brother are cooperators in the soil conservation district program. J. P. Kellett, the brother, bought a farm in 1939 and operated it under a CCC camp plan. He later bought another farm and had a conservation plan made for it. When he bought his third farm, he started a dairy and now wholesales Grade-A milk.





**Strip cropping on farm of Mrs. Nellie Hopkins, Fork Shoals community.**

"There's not one farmer in 500 who can plan his farm and put in terraces, waterways, and other conservation practices like they ought to be," he said. "My grandfather owned the first place I bought and figured if he got 8 or 9 bales of cotton

on 20 acres, he was doing pretty well. With strip rotations of small grain, lespedeza, and cotton, I make a bale to a bale and a half to the acre."

Charles Kellett's seed-cleaning plant is just one example of an entirely new industry that has developed as a result of the soil conservation program. *There are a half dozen such plants in Greenville County alone. Actual records show that more than 600 such plants have sprung up in the 9 Southeastern States and the number is rapidly increasing.*

And back of the seed-cleaning operations is a still larger business, the production and marketing of the enormous volume of seed that farmers are producing in this new farming program now sweeping across the Southeast. Estimates of Soil Conservation Service technicians working with farmers out there on the land in 400 soil conservation districts show that more than 300 million pounds of grass and legume seed, kudzu crowns, and grass stolons were produced in the Southeastern Region last year.

These estimates reveal that from two-thirds to three-fourths of the total production was on farms whose owners are cooperating with their local soil conservation districts in carrying out complete soil and water conservation programs. Many of the kinds of seed produced in greatest quantity—such as blue lupine and Suiter's grass—originally came from stock distributed to farmers by Soil Conservation Service nurseries through local soil conservation districts for seed-increase plantings.

George DePass, the Spartanburg attorney quoted earlier, who has 250 registered Hereford cows on his Quarter Hereford Ranch near Spartanburg, said if the Soil Conservation Service hadn't done anything but introduce and spread the use of Suiter's grass, it would have more than paid for itself.

"Until 9 years ago, when I started cattle farming, I operated a \$10,000 cotton farm with \$2,000 worth of equipment on it," DePass said. "Today, with 400 acres of fescue (Suiter's grass) and the other soil conservation improvements, I have a \$40,000 farm with \$50,000 worth of cattle on it."

Henry J. Winn, vice president and trust officer of the First National Bank of Greenville, S. C., recalled conditions of only a few years ago—conditions which most people have forgotten about in the swiftly changing agricultural pattern.

"Until 15 years ago," Winn said, "a farmer would put a fence around the sorriest piece of land





**Charles Kellett has a thriving seed-processing business as result of Fork Shoals conservation boom.**

he had, call it a pasture, and pay no more attention to it. The Soil Conservation Service came along and proved to farmers that they could establish adaptable grasses and legumes that were not only good for the land, but provided abundant grazing.

"This has stimulated the development of cattle raising and farmers have become diversification minded. They are now raising less cotton, more feed and cash crops of various kinds, and have come to realize that cattle have become an important cash crop in this section.

"Through the efforts of the Soil Conservation Service, there has been developed a year-round grazing program of fescue, Ladino clover, and other plants which have tremendously benefited the farmers of this section. It's not limited to this area, though. These grazing crops have resulted in the development of sizable herds of cattle throughout the entire Southeast."

S. B. Huff, chairman of the board of supervisors of the Greenville County Soil Conservation District, is community leader of the Fork Shoals Road community, which includes 87 farms, comprising 8,918 acres. Huff's home is located in a grove of huge oak trees. Under the spreading branches of these 150-year-old giants many community meetings and social gatherings are held. The spacious lawn was the scene of a picnic arranged by the supervisors when Chief H. H. Bennett of the Soil Conservation Service visited the community recently to observe progress of the work.

Preceding the picnic, the group—the Chief, Jim Sargeant, and others—attended services at the

Standing Springs Baptist Church and heard a forceful sermon on soil conservation by Dr. Robert W. Jackson, who in addition to serving as pastor of the rural church is assistant professor of religion at Furman University in Greenville. Dr. Jackson emphasized in his sermon that productive soil is one of God's gifts to man and as such deserves the care of faithful stewards.

"No matter where we live or what we do, we can never get far away from the soil," he said. "Whether a man lives in a rural area or in a penthouse in New York, he is dependent upon the soil. . . . When we realize that the soil is a gift of God and that it takes from 400 to 1,000 years to build a single inch of topsoil by natural processes, we realize that we face a solemn obligation in the treatment of our land. The soil is very precious and is the basis of our physical existence."

As an indication of the effect that soil conservation has had on the religious phase of community life, Huff points out that practically every rural church in the area has built a home for its pastor and that most of them have enlarged or are preparing to enlarge their church plants.



**Hugh Bennett, S. B. Huff, sericea, at Fork Shoals community.**





Bermuda makes greedy grazing by Brown Swiss and Holsteins on the Maddox Brothers farm in Fork Shoals community.

In the Poplar Springs community of Spartanburg County, Jake Bridwell, community leader and member of the board of supervisors of the Spartanburg Soil Conservation District, says that his community group worked together so well in soil conservation activities that they pitched in and built a parsonage for the Reverend C. C. Nanney, pastor of the Poplar Springs Baptist Church. Bridwell himself donated the land, and members of the group donated most of the material and did the actual construction work. The Poplar Springs group includes 44 farms, comprising 3,027 acres, cooperating in the soil conservation district program.

"When we learned to work together in soil conservation, we found that we could work together in other things too," Bridwell said. "We have developed pride in our community."

The community spirit shows itself in many ways. Homes have been painted and home grounds have been beautified. Large signs have been erected on each road leading into the community reading, "Entering Poplar Springs Community. Organized to Build a Permanent Agriculture." A couple of years ago, the soil conservation group put up money for prizes in a rural-mail-box contest, sponsored by the local home-demonstration club.

Arthur Harmon has a beautiful home on a pine-covered knoll beside a large fish pond that sparkles like a gem in the grass-covered countryside. The entire inside of his home is paneled with 27 different species of trees, all harvested from his own farm.

Ward Crimm, owner of Poplar Springs Farm, has developed one of the finest herds of dairy cows in the entire country.

In 1948, the Poplar Springs community won a combine as first prize in a community soil con-

servation contest sponsored by the Spartanburg *Herald-Journal* in six counties in its circulation area.

The first contest was so successful that supervisors of soil conservation districts through the area decided to conduct a second community contest. Ninety-eight local communities, comprising 1,469 farms, are competing in this second 2-year contest for prizes totaling more than \$21,000 offered by local merchants, textile mills, and other business firms.

H. C. Arthur, manager of the A. N. and Sam T. Means farm in the Poplar Springs community, says, "Soil conservation has had more effect than anything else we've ever done in this country. We used to build terraces with a light terracing machine and every time there was a hard rain, we'd expect some of them to break. Now with strip cropping and meadow strips, we don't worry any more about it.

"I've planted 14 crops of cotton here. We used to have 200 acres in cotton. Now we have 100 acres of cotton and 100 Hereford cows. Even with the boll weevil, we average a bale of cotton to the acre."

Farmers who once rarely ever got around to visit among their neighbors now meet and work together regularly. A community that was once unknown outside of its own local area has entertained visitors from many foreign countries—visitors from China, Japan, Burma, India, Switzerland, South Africa, England, Australia, France, and Mexico. They came to Poplar Springs to see what kind of conservation program a community can build when neighbors work together.

A. D. Madge, secretary and assistant treasurer of the Pacolet Mills in Spartanburg County, was so impressed with what was being done at Poplar



Country churches prosper in the presence of soil conservation. The Poplar Springs Baptist Church is typical.

Springs that he bought a farm there 2 years ago and makes his home in the community, although it is 20 miles from his office at Pacolet. He takes an active part in the life of the community, has a district plan on his farm, and has developed a herd of 44 Hereford cows.

Even before he bought the place, Madge called on A. H. Skardon, SCS work unit conservationist in the community, for advice on the possibilities of the land. "I had no previous farming experience," Madge says, "but Skardon held my hand all the way and he has done a wonderful job of advising me what to do at every step."

As a mill executive, Madge is thoroughly familiar with the industrial revolution that has taken place in the Southeast during recent decades. And he is equally enthusiastic about the agricultural revolution taking place in the soil conservation districts of the region.

Madge sees wonderful opportunities for development of marketing facilities and supplies to meet the needs of the growing livestock development throughout the Southeast.

Actually, the revolution has just begun, he says, and the fight against erosion will require constant vigilance—maintenance, like anything else.

"I can sit in my office and see the Pacolet River," he says. "After a hard rain it runs yellow or red with eroded soil. We've got to keep fighting in every community till we get the job of soil conservation done on every acre of land."

"That's what we're trying to do in the Poplar Springs community. And we're going to make it the finest community in the world."

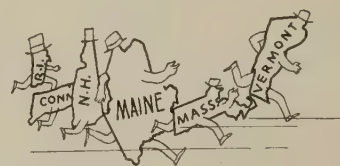
And some misinformed people have said that soil conservation is all right but we will never get the job finished at the rate it has been going. Why don't these wise fellows go down into Spartan-

burg and Greenville Counties and see for themselves what good progress is being made? Nearly 150,000 acres have already been treated for soil conservation—a rate that is a highly encouraging accomplishment, especially for these small, highly industrialized counties. It's truly a revolution on the land!

**GRANGE SPONSORS CONTEST.**—Five individual cups and a district cup are to be awarded by the Maine State grange to the supervisors and the district that does the best job in the year. The contest will be conducted through the State Association of Soil Conservation Districts. Additionally, the State grange proposes to make soil conservation an annual project.

**CHURCH GROUNDS PLANTED.**—As a result of Soil Stewardship Sunday at Zion Church in White County, Ga., 35 of the 40 churches in the county are planning to landscape and plant grass on the church grounds this fall. The Reverend C. A. Hall, pastor, hopes to get all churches in the county to participate. Supervisors of the Upper Chattahoochee River district cooperated in making the stewardship Sunday a success.

**AIR TOURS.**—Two air tours to provide farmers and others with a bird's-eye view of conservation on the land were held as a part of Kentucky's Conservation Week last July. Paying passengers numbered 711. Pilots estimated that 90 percent were farmers and 75 percent of the passengers were making their first flight.



**GREEN PASTURES ZOOM.**—With Vermont setting the pace, New England's 1951 green-pasture program boasts 3,482 participants. This is a gain of 466 over 1950 and 715 over 1949. There is increased enrollment in every State except New Hampshire. Vermont leads with 1,185 participants, 289 more than last year. Maine made the next largest gain, 219 over the 1950 total, but Massachusetts has the second largest total enrollment, 914 which is 11 more than last year. New Hampshire, Connecticut, and Rhode Island follow. Rhode Island staged a strong spurt this year by more than doubling its 1950 total. This year it has 127 participants, as against last year's 63.





Ellen Hartnett

# BETTER-FED NATION STARTS WITH BETTER-TAUGHT CHILDREN

By **ELLEN HARTNETT**  
**Community College, Drake University**

**A**MERICA has never been in greater need of citizens who can think clearly. Time was when the so-called educator drifted in the clouds, while the administrators pointed with pride to the "Science with Practice" placards over entryways. However, inside the classroom the college professor, protected from the world of reality, continued to float in the clouds and very seldom realized the importance, or even the existence, of grass-root problems.

Today the college situation is gradually undergoing a face lifting. We are much more interested in the individuals who come to us for an education than the subjects we teach. We are also developing courses in our institutions which will help to meet the need of our people.

In America today we are very much concerned about being a well-fed nation and we are also interested in helping to ease the hunger pains of our neighbors. With these objectives in mind, our colleges and universities are developing courses in conservation education.

Our conservation course in the Community College at Drake University, Des Moines, Iowa, has developed from a felt need. Last year I taught this course in three different locations in Iowa. All of my students were teachers. Some were working on certificate renewals and needed college credit; however, the majority of the students were more interested in getting new techniques for teaching, and in becoming professional, well-prepared teachers.

In two of the instances the teachers came to class 3 hours in the evening, 1 evening each week. Because I have been a teacher, I knew that they were

already weary from work before the class started; therefore, my ultimate goal in the course was to send a better teacher back to the classroom each week. All of the assignments were designed for the classes they would meet the very next morning.

The first conservation lesson in my course deals with "Saving the Teacher." In this first lesson I try to give as many helps as possible in order that the teacher will be able to do her best work.

Since we are still working to improve teacher standards, our State still clings to a stereotyped course of study in conservation. This will not be necessary when we have had an opportunity to give each teacher a more adequate training program. Children and well-prepared teachers rebel against course-of-study details because they know that the conservation needs of one community are not necessarily the needs of another community.

Of course, background is important and such information cannot be looked upon lightly. We Americans once had custody of 1,900,000,000 acres of land, over half of which was suitable for croplands, pasture, or range. Some 40 percent of it was virgin forest, with the remainder natural desert and mountaintops.

Today our story is a different one. We have only 17 percent of that 40 percent of timber left. The Soil Conservation Service estimates that our total cropland is today about 460,000,000 acres. It is stated that 3,000,000,000 tons of topsoil wash or blow away from American farms every 12 months. Now, these are facts we can't ignore, but how can we get facts taught in a way to create interest, enthusiasm, and a desire to do something about such a situation.

Well, first of all, we try to teach the teachers to find the interests of the children. We believe that children have definite interests and that they will be more likely to learn something usable if they are permitted to help select the problems they wish to explore.

Next, we train teachers so that they will not require every pupil to study the same topic. Once student interests are explored we are ready to develop work groups and find particular interests within groups.

Purposeful planning makes it possible to combine conservation education with other subjects. Correlation is a must in any good teaching. We do not teach subjects in an unrelated way today. We fit each mosaic into the pattern until we have a well-rounded curriculum and eventually we also have arising unique events which show originality of the child in relation to tasks.

Spontaneous interests are encouraged. A tree outside a school window may become an inspiration. A bird's nest, in one instance, drew interest one way. The teacher seized this spontaneous interest and planned a unit of work with the children. Science, writing, creative art, and music were all combined as children were encouraged to use many media of expression.

Many activities, which included the study of temperature, climates, and care of buds, developed.

The children's drawings and writings were used in developing a program. A home-made movie, a puppet show, and some original songs gave a release to expression and stimulated a valuable experience for the children and patrons.

We have found that most teachers do not fully utilize the resources of the community. On giving a few helpful hints, however, we found teachers and children were able to take advantage of opportunities within the school district. Patrons became more interested in contouring and other conservation practices after the teacher and children presented a program on the subject. One farmer invited the class to watch him plan a contour, and the older boys actually helped with the work. Of course, they told their parents about the project. Soon other contoured fields began to appear.

Conservation programs must be expanded beyond the four walls of the classroom. When teachers provide a variety of experiences in the classroom, we find children more likely to explore other avenues for learning outside of the classroom. We must learn to bridge the gap between those things which the child should learn and those things which he wants to learn.

We do not try to mold a particular type of teacher in conservation education. Instead, we try to stimulate each individual to find within himself

a potential to be developed. We try to develop an academic and professional interest in a scientific background. The material in this field of conservation is no more specialized in character than that of other fields. It forms a part of the total background for classroom teaching.

The scientific method of approach is very important in all who are teaching today, but perhaps conservation gives a better opportunity to practice it. Even young children enjoy the elements of scientific method in finding out new things by (1) questioning, (2) searching for explanations, (3) realizing explanations, (4) rejecting guessing, (5) repeating an experiment to check truth, (6) demanding more evidence, and (7) questioning accuracy.

In conservation there are many problems to be studied. Each class should define its problems in relation to the area. Methods of coloring the problems will also correspond to the demands placed by the group. It makes a difference, too, whether the problem comes from the teacher or the children. The American people have been called upon frequently to vote on questions of conservation. The attitudes built up by using the scientific method in the classroom may have a real bearing on intelligence in casting the ballot. "Scientific method is more important to the human race than collection of scientific facts," says Philip B. Sharpe. The scientific method is only about 400 years old, but it has already produced more facts and inventions than all the previous 400,000 years of human progress. What present scientific facts have done to our world, we see; what scientific method will do to the world of the future staggers the imagination.

At Drake University our teachers are taught the art of encouraging *discussion*. This is a vital part of conservation education. They are also taught to encourage *experimentation* and how to aid the children to visualize certain natural forces at work. *Observation* by excursion teaches many lessons that cannot be taught in the classroom. Reading occupies an important place in conservation education. Through these media the child and teacher continue to get facts, new and old.

We have found that many intelligent adjustments are made through our conservation programs. Here each individual dares to present his own interpretation upon the environment. His evaluation becomes important in respect to the requirements and needs he places on life.





Miss Hartnett conducting "classroom of the air" on 300-mile observation flight over western Iowa. She found it an excellent means of explaining contouring, strip cropping, grassed waterways, terraces, and farm ponds.

Here we have just a few examples of ways in which we can make our teaching meaningful.

The following timely story is told by a teacher of a one-room rural school. This young man, Charles Kaldahl, of Harlan, Iowa, caught the spirit of a whole community by magnifying the importance of participation. He reported as follows on "How My School Developed an Honor Code":

"Monday during language period, I asked the sixth and eighth grades to define the words 'honor' and 'code.' We discussed various meanings and finally arrived at the ones we felt adequate.

"Next, I explained what an honor code meant to me. This brought about quite an interesting discussion. I could see the interest building up. One boy in the sixth grade said, 'Why couldn't we make one?' meaning an honor code. So, for Tuesday's language lesson I assigned just that, An Honor Code, but I asked, first, 'How do you want to go about it?'

"The class suggested that we decide what should be in a code. Finally five parts were agreed upon: (1) Saving soil, (2) protecting wild flowers, (3) protecting birds, (4) conserving wild animals, and (5) protecting our forests. An eighth-grade girl suggested each student should work on one particular part of the code for the preparation. There are five in our sixth and eighth grades. Each was assigned to write a paragraph on the topic in the code which interested him most.

"On Tuesday I started the class by having the topic on soil read. Then the class and I worked together to condense it. This was a real job but every-

one worked hard. Finally, we all felt we could approve it. The group then appointed a chairman and a secretary. The chairman led the discussion, using the blackboard to chart the work to be done so that all could see the development of the honor code. The secretary then copied the completed paragraphs. By Wednesday the honor code was completed. Then the class decided to have the honor code printed on white oak tag and to post it in the classroom. This project alone was both interesting and revealing. Finally, the poster was completed with decorative cartoons drawn by a talented child. This poster displaying our honor code became a point of interest for many conservation lessons in the classroom and many discussions in conservation in the community.

"A district school program, for all in the community, centered around this activity.

"It is only fair to mention that the superintendent, F. E. Brouhard, of Shelby County, encourages our programs. Without his encouragement we could not have progressed so rapidly."

Another good example is the "Spring Unit," as developed by Catherine Malone, a teacher of Ottumwa, Iowa. Her class is on the primary level, but not too young to participate.

Here we have a summary of a unit as carried out in a city school.

"Our unit was introduced by the film, 'Spring on the Farm.' We studied farm animals and their babies.

"Each child made a booklet showing six farm animals and their babies, and wrote a short story for each picture.

"We made a class scrapbook, each child making a picture showing some 'sign of spring,' and writing a short story about it.

"We had a spring vocabulary on one of our boards, which helped with spelling. We are doing some creative writing, poems and stories.

"We are planning a tea for mothers on the Friday afternoon before Mother's Day. Our program is being developed from our unit."

A third good example has to do with a unit on wildlife, by Norma R. Ruby, Harlan, Iowa. It outlines as follows:

"Objectives:

1. To understand and compare wildlife as it existed in the early days of our country and as it is today.
2. To understand value of wildlife to man in (a) early days, (b) today, (c) the future.
3. To understand how carelessness of man has destroyed and reduced wildlife.
4. Other factors in destroying wildlife.
5. To understand the value and necessity of restoring wildlife.
6. How this can be accomplished, and is anything being done?

"Procedure:

1. Stimulating interests of children.
2. Creating a desire to learn more about animals and birds.
3. Finding all available materials—books, pictures, slides, excursions, etc., and putting at disposal for study and research.

"Topics for discussion:

#### I. Wildlife in Early Days

1. What do you know about wildlife in the early days of our country?
2. Value of wildlife to men of early days.
3. Why was wildlife more prevalent then than now?
4. What caused the reduction of wildlife and extinction of some kinds?
5. What did man do toward this reduction?

6. What other things may have helped cause it?

#### II. Wildlife Today

1. What animals are common today?
2. Are animals valuable to man now? How?
3. Reasons for preserving animal life.
4. Are animals more useful or harmful to man today—the farmer particularly?
5. Should we try to restore and conserve wildlife today? Why?
6. How can this be done?

#### III. Wildlife in the Future

1. Why should we save our wildlife?
2. What can be done?
3. What is being done?
4. How can children help?

"Activities during unit study:

1. Bulletin boards.
2. Finding pictures and news stories in papers and magazines relating to subject.
3. Excursions and hikes.
4. Interviews with and talks by people who may have knowledge of subject.
5. Movies and slides.
6. Studying (reading about) footprints of animals.
7. Drawing pictures of animals' homes, burrows, lodges, etc.
8. Conducting quiz programs.
9. Making graphs and charts.
10. Writing poems, songs, and plays.
11. Watching animals and birds for habits.
12. Learning to identify animals by making use of encyclopedias and other sources of information.
13. Visiting beaver dams or lodges.
14. Making bird-feeding stations.
15. Writing letters for information.
16. Studying (where to find) game laws of State.
17. Posters on conservation.

"Culminating activities:

1. Planning a program or writing a play to present to other grades, based on knowledge acquired during unit.
2. Making a scrapbook of (1) pictures



collected, (2) papers written on animals and birds assigned to individuals, (3) poems, (4) art—animal tracks, homes, etc., (5) copies of game laws, etc.

3. Making charts to show information learned about each animal studied—homes, food, interesting facts.
4. Seeing the excellent movie that fitted in with our particular unit, 'A Heritage We Guard.' This showed wildlife and our land as it was in the 1600's and its deterioration through the years up until recent times, showed concern over past carelessness, and indicated what attempts are being used to combat it. A very fine finish for our unit."

The foregoing examples of conservation education developed from within the school. State courses of study handed down will never foster the kind of learning we need in conservation, and legal compulsion will only hinder the program.

Educators must understand that the teaching of conservation is a recognition of responsibility to both present and future generations. This responsibility originates with the people and should be shared by their schools. The extent to which the local school discharges that responsibility is a measure of soundness of its program.

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**NICE DEAL FOR FARMERS AND U. S.**—This is a story of cooperation between public agencies.

The real-estate division of the Corps of Engineers, United States Army, Chicago district, has the job of leasing to farmers some 81,000 acres of land suitable for agriculture and not currently needed for military purposes.

The object of this outleasing program is (1) to make the land available for food production, (2) to assure that the land is farmed in accordance with modern soil conservation methods, (3) to reduce Government maintenance costs, and (4) to obtain fair rental returns for the Government.

The land available for leasing has been divided into 352 tracts. For each tract a 5-year cropping plan, including all the necessary soil conservation treatments, has been prepared. Soil samples have been tested and all available research data useful in guiding the program have been assembled. Assistance of Soil Conservation Service technicians working in soil conservation districts has been utilized in making the final plans. These plans are made a part of the lease specifications and success-

ful bidders for the 5-year leases must agree to follow the conservation plan for the various tracts. Leases are granted only to responsible bidders.

Seventy thousand eight hundred and seventy-nine acres are operated under agricultural leases or permits, in accordance with a basic conservation plan. This is equivalent to 335 additional average-size Illinois farms.

This land, based on average yields, adds annually to the Nation's food supply some 526,000 bushels of corn, 11,900 bushels of soybeans, 287,000 bushels of oats, 70,000 bushels of wheat, and 16,000 tons of hay. In addition, some quantities of tomatoes, sweet corn, peas, cranberries, and even a little mint are produced.

Livestock is employed extensively as an economical means of controlling the vegetative cover. Pasture has been provided for some 52,000 head of cattle and 23,000 head of sheep. Many of these animals come from drought-stricken areas of the Southwest and, at their present rate of gain, will eventually add some 2½ to 3 million pounds of meat to the Nation's food supply.

The total annual benefits to the Government from this outleasing program in the Chicago military district is \$643,183 or \$8.50 per acre. Of this total benefit \$264,957.91 is a saving in maintenance cost that would have had to be paid for out of appropriations if this program were not in effect.

Improved public relations has been an important value stemming from this cooperative effort. In addition, this Government land is setting a good example for private landowners to emulate. Lessees have erected, at their own expense, neatly constructed cornerribs and fences and have cooperated well in mowing weeds along roadsides, to add to the well-kept appearance of the properties.

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## NOTES FROM THE DISTRICTS

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**PILOT AGROUND.**—Sam Polston, work unit conservationist in the Highlands Soil Conservation District in Florida, recently helped plan the 1,200-acre ranch of C. R. Disher, retired commercial airline pilot. Disher said he had seen a lot of land from the air, but that putting capability delineations on an aerial photograph has changed the meaning of land to him. He is very proud of his capability plan, Polston reports.

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**KUDZU WORTH \$200 PER ACRE.**—T. F. Purvis, cooperator with the Briar Creek (Ga.) Soil Conservation District, planted 40 acres of kudzu in 1942 as a part of his conservation program. Since 1946, he has averaged 2 tons per acre of high-quality hay from it. Dry weather last summer forced him to start grazing the kudzu, which provided the finest grazing he ever had. "I wouldn't take \$200 per acre for it," he said.

**HUGE OUTDOOR CLASSROOM.**—Conservation education from textbooks alone may soon be outmoded in the Kingsley community of the Grand Traverse (Mich.) Soil Conservation District. Picture a 640-acre classroom with 6,000 students—that's Kingsley's second annual Conservation Field Day held 2 days last spring.

Sounds big. It was big. It was the second time the event was held at this site. It will probably be staged again in 1952.

Events like this don't "just happen." You have to have a site for the event, and you have to have a worth-while purpose. To quote from the program, "This is a presentation of the conservation needs of this locality and a demonstration of the measures that can be put into practice when civic-minded people, private landowners, and governmental agencies work together." Many areas have the facilities, but Kingsley had, in addition, the civic-minded people.

Call it "Better Land Use Day" or "Conservation Field Day" or whatever you choose. We like the reasons given in the program. "The soil furnishes us with food, clothing, shelter, and a great portion of our more healthful forms of recreation. Be good to it." Let's call the purpose, then, the need for emphasis being put on the soil, our basic resource.

Probably 200 people from the area helped: Town people, teachers, farmers, farm organizations, merchants, local agencies, State and Federal agencies, everyone with something to contribute. Conservation agencies, the local soil conservation district, and others, were glad to cooperate. Conservation education is an important part of their jobs, and, after all, you don't get a chance to reach 6,000 people very often and in such ideal setting.

The Kingsley School Forest, first started in 1930, and the Certified Tree Farm of Howard Dunn constituted the 640-acre classroom. By foot it would have taken a good half day to cover the 4 miles to reach all demonstrations. But with 15 farm tractors and trailers, each hauling around 30 persons, it was possible for everyone to ride around and take in the sights. In fact, several workers detected people making the trip a second or third time.

There were 47 stops. There were virgin timber, reforested areas, and cleared land—land that man had attempted to farm. From stop to stop it was a continuous story of tree-seedling production to timber products and utilization; from tree planting to timber harvest, including demonstrations of fire fighting, laminated rafter construction, boat building and maple-syrup production. Tree identification, site selection, insect and disease control, and deer damage were all included. Recreational uses of the area, its value for camping, fishing, hunting, and trapping were emphasized by demonstrations of fly and bait casting, archery, the safe use of firearms, and model Boy Scout camps. No phase of conservation education was neglected.

When you know that perhaps two-thirds of those attending were school children who came by school bus and accompanied by teachers, you realize the lessons that can be opened up in future school work, capitalizing on the impressions that the children must have picked up on their tour. Conservation education from books alone is an inadequate approach in the Kingsley area.

Kingsley folks expect other areas in the State to hold similar events.

—W. S. HARRISON and GUY SPRINGER



**TEN MAGNIFICENT YEARS.**—The Sugarloaf Soil Conservation District, in Nebraska, recently observed its tenth anniversary.

The eighteenth district to be organized in the State, it stands today with 94 percent of the privately owned land under conservation plans developed by SCS in cooperation with the district. Its board of supervisors manages 91,000 acres of federally owned lands.

When the landowners in the Sugarloaf district took advantage of the State law permitting its organization 10 years ago, not a vote was cast against it. Its name comes from Sugarloaf Butte, a widely known landmark. It includes 225,335 acres in northern Sioux County and northwestern Dawes County. The federally owned acreage was bought during the submarginal land-purchase program in the 1930's and has since been developed for grazing.

First supervisor was Frank Arner of Crawford, appointed by the State Soil Conservation Committee as required by State law. His first job was to set up machinery for election by the people in the district of the other four members of the board of supervisors. C. W. Golden of Crawford, Charles Ferguson of Whitney, A. L. Schnurr of Harrison, and Jacob Wasserburger of Montrose were elected.

Theirs has been the job of administering the affairs of the district since then. Each was returned to office as his term expired, showing the people's confidence in their leadership. Four serve without pay, except for a small mileage fee. Schnurr, secre-



tary-treasurer, is paid a small salary to keep the district's books and do the clerical work.

These men made arrangements with the Soil Conservation Service for technical aid, and with other groups and agencies that could help.

Only a few years after the soil conservation district was organized, the Soil Conservation Service had about finished the improvement work needed on the Federal land. It was ready to aid in the establishment of stable livestock enterprises. The district supervisors took on the job of managing the land—settling preference rights, granting grazing privileges, collecting the grazing fees, maintenance of watering places, and so on. The SCS supplies the technical advice concerning the management.

These were the first soil conservation district supervisors in the United States to assume this sort of responsibility. Some idea of the size of the land-management job is indicated by the fact that last year the supervisors paid \$10,182 to the Treasurer of the United States for grazing fees.

By 1946, the supervisors faced the problem of providing special equipment for use by district co-operators in putting their conservation plans on the land. The board bought a crawler-type tractor and 4-cubic-yard scraper, and hired Clyde Mills as operator. The equipment and operator were supplied to the co-operators at an hourly rate. Mills is still the operator.

Also in 1946, the Sugarloaf Soil Conservation District was a winner in the *World-Herald* soil conservation achievement program. The award was \$500, which was promptly invested in a bulldozer attachment for the tractor. Later, a cement mixer and grader were bought. Today, all equipment is paid for—paid entirely out of earnings on conservation jobs.

Twice, the district co-operators were the focal point in pest control. They got the cooperation of the United States Fish and Wildlife Service in the control of prairie dogs. They also got the cooperation of the Bureau of Entomology in a grasshopper-control program. The supervisors obtained the grasshopper bait for resale at cost to district co-operators, and two Bureau of Entomology employees instructed the farmers and ranchers in its proper use.

Today, the district lists among its assets equipment with a present value of \$9,000 and over \$4,000 cash. But much greater are the assets resulting from the co-operators' achievements in putting the district program into action.

**GRASS DIGGINGS THE FASHION.**—Log rollings, where neighbors gathered to help clear land and burn logs, are mostly of the past. But grass diggings, where neighbors gather to dig grass to plant pasture, are gaining popularity down around Tallahassee, Fla.

It started 3 years ago with a community digging in which Coastal Bermuda-grass stolons were planted on the farm of Oscar Hurst. Hurst's farm furnished stolons for planting on other farms in another community digging. Chairman B. C. High of the new Wakulla Soil Conservation District rounded up eight neighboring farmers, who obtained planting stock through the courtesy of Hurst and the Ochlockonee River district. In a similar operation, Bishop Holifield, Negro technician, arranged a pangolagrass digging for Negro co-operators of the Ochlockonee River district on the farm of the Florida A. & M. College for Negroes.



**PACE SETTING PAYS OFF.**—What conservation farming means to hill farmers is demonstrated in the changes 6 years have brought at Ralph Jennings' dairy farm in Allegany County (N. Y.) Soil Conservation District. On land that did not produce enough hay and pasture for 12 head in 1945, he is producing more pasture and hay than he can use for a herd of 26 cattle. Additionally, he has control of erosion, is reestablishing the fertility of his farm, and is saving his down-hill neighbor at least \$500 a year through improved crops and elimination of damage from water that came flooding down from the Jennings farm.

Jennings has removed hedgerows and stone piles, built diversion terraces, established contour strips, and improved pasture by leveling and brush and stump removal. Five years ago he had to pasture his wood lot. Today his cattle are fenced out. The diversion terraces have stopped the washing of soil, and on them he is producing the best hay on his farm. He's selling, instead of buying hay. His complete conservation plan is about 100 percent established.

Twelve hundred other Allegany farmers are operating the conservation way, following the pattern set by Ralph Jennings and other pace-setters.

## FLYING TEACHERS

(Continued from page 74)

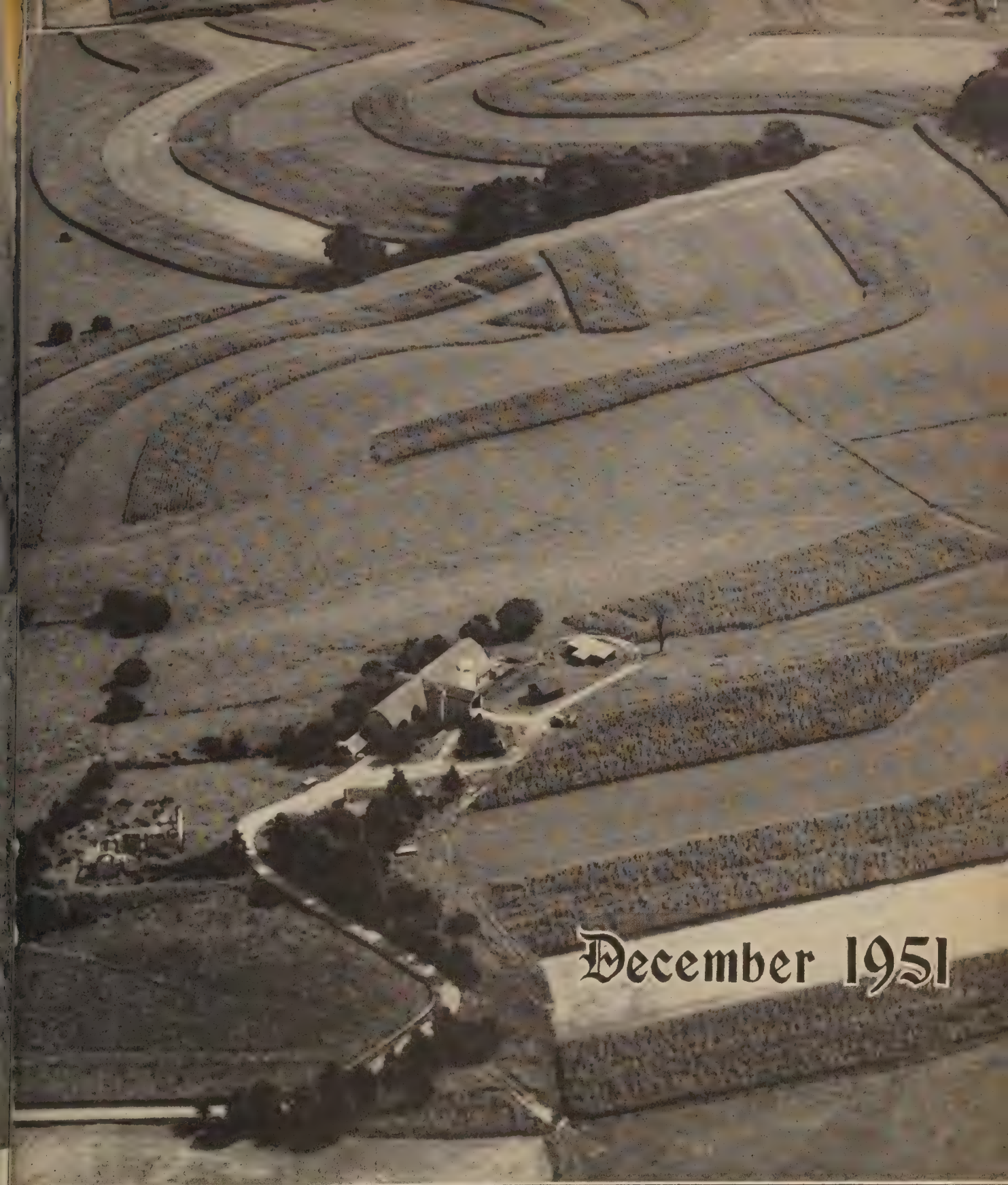
On the air tour the pilot flew the DC-3 at a low altitude so that the conservation students could better see the land beneath. Gullies and eroded spots showed up plainly, as did the dark green areas of fertilized and well-managed soil. The tour covered 120 miles of circling the district.





A new truck and two new tractors were among the many machinery casualties of the great flood which laid the valley low. See the article in this issue, "The Complete Watershed Program in Flood Control."



An aerial photograph of a rural landscape. A winding river flows through the scene, with several large, rectangular fields on either bank. A small farmstead with a few buildings and trees is visible in the lower-left quadrant. The overall tone is sepia or aged black and white.

December 1951

# Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE



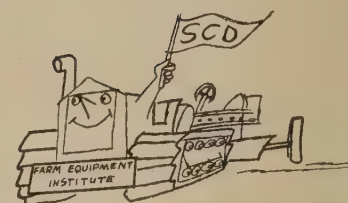
# SOIL CONSERVATION•

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ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE  
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**BOOKLET BRINGS FRIENDS TOGETHER.**—How farm-equipment dealers can bring greater prosperity to their communities is shown in a booklet, "The Farm Equipment Dealer and His Soil Conservation District," recently published by the Farm Equipment Institute.

Prepared under the direction of the institute's soil and water conservation committee, the two-color booklet describes why farm-equipment dealers should become aggressive workers for soil and water conservation.

"Our business of making and selling farm equipment," the booklet says, "is based primarily on the farmer operating a profitable business. If the productivity of the soil is eroded away by wind and water, or reduced by bad cropping practices, the farmer makes less profit. When the farmer follows modern conservation methods in his operations, he'll have greater profit and more permanent income. He will be in a better position to buy the farm equipment he needs. He will have more money to educate his children. He will be able to provide better medical care for his family, as well as better housing and farm buildings, and other items which help to raise the standard of living for the entire community."

(Continued on page 108)

**WELLINGTON BRINK**  
Editor  
Art Work by  
**W. HOWARD MARTIN**

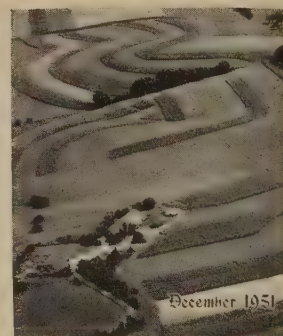
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**FRONT COVER.**—This strip cropping is part of the conservation farming on the farms of Albert Fox, Merrill Pratt, and William Darlington, in Chester County, Pa. The photograph is by Hermann Postlethwaite.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



# THE USE OF WATER IN HUMID AREAS

By HUGH BENNETT

**W**ATER has long been a controlling factor in the economy of the drier parts of the Western States; today it is rapidly assuming the importance it deserves in our more humid areas.

As industrial, urban, and agricultural expansion continues to accelerate in the East, water becomes a resource of increasing importance—a matter of critical significance with the rest of the country. Crops damaged by flooding in spring may be lost by drought in midsummer. Land needed for increased crop production may be so wet over a large part of the year that only by extensive drainage can it be brought into best production. Cities—even New York, the world's largest—at times may be complacent with overflowing reservoirs, only to find themselves rationing water a few months later.

In humid sections the need for management, conservation, and more efficient use of water in agriculture, as well as industry, has been recognized more slowly than in dry climates. Today, however, there is very little argument remaining as to the need for storing water in the soil, for capturing it for application to the land, or for disposing of it in an orderly manner.

"In all parts of the country . . . there is a growing recognition that we must conserve and develop,

as well as use, our natural resources. And in conservation and development, as in use, water is the key resource.

"Now midway in the twentieth century, two facts have become compellingly clear.

"The first is that water is limited in relation to the many and varied needs for its use.

"The second . . . is that the management, conservation, and use of our water resource is inextricably bound up with the management, conservation, and use of our land and that both are essential to our expansion as a Nation."

In these words the President's Water Resources Policy Commission points up the need for sound management, conservation, and use of both soil and water without regard to geographic, climatic, or political boundaries.

Use of available water is of concern to both agricultural and nonagricultural interests. Both must share whatever supply there is; both must suffer whatever damage accrues from drought or flood or mishandling of the water resource.

A sound program for the conservation and orderly use of water in the humid portions of the United States must have as its purpose the physical control, protection, management, and use of this resource in such a way as to maintain crop and grazing lands and wildlife habitat for maximum



Deepened stream channel resulting from 15-acre drainage project supplies ample water for irrigation of this Ladino pasture on Bahler Farms, Inc., near Ellington, Conn., in the Tolland County Soil Conservation District. This farm placed first in the Connecticut Greener Pastures Contest.

sustained benefits to people, agriculture, industry, commerce, and other segments of the Nation's economy. Such a program necessarily encompasses:

- (1) Improvement of local supply, distribution, and use of water for irrigation and other agricultural purposes; provision for additional water; protection of existing supplies and of irrigation systems; and reduction in nonproductive use of water by certain types of vegetation.
- (2) Development and protection of municipal and industrial water supplies, including reservoirs and wells.
- (3) Drainage of wet fields, pastures, and other lands hazardous to agriculture; and protection of overflow areas—in order to bring about better use and protection of bottom lands and to increase and maintain soil productivity.
- (4) Prevention of floods to reduce damage to life and property (by floodwater and sediment).
- (5) Development and protection of recreational resources and fish and wildlife and their habitats.
- (6) Conservation of runoff, otherwise wasted, through the use of farm ponds and diversion and spreading operations—for various farm and ranch purposes, such as fire protection and convenient access to water for spraying and livestock.

Even in humid areas where rainfall is generally considered adequate and in some instances excessive, there are from time to time crucial periods during which soil moisture is insufficient for optimum plant growth. This has been known since farming started along our eastern seaboard. Only recently, however, have we understood the full potentialities and economic feasibility of humid-area irrigation. Of course, crops like rice, cranberries, and water cress, which require ground saturation or actual inundation, have been irrigated for generations. At present, irrigation is being increasingly used for fruits; intensively grown, shallow-rooted crops, such as vegetables, berries, and flowers; and for high-producing pastures and other forage and field crops where temporary shortages of water sometimes critically depress yields. In the humid areas irrigation is steadily becoming a key factor in the conservation and use of land and water.

Preliminary 1950 census figures show that there were large increases in humid-area irrigation during the period 1944 to 1949. The largest acreage irrigated outside the rice-growing sections is in



**This Florida orange grove is irrigated from a farm pond.**

Florida, amounting in 1944 to 221,917 acres on 4,092 farms. This was principally for vegetable, citrus, and flower production. Other humid areas having substantial acreages irrigated in 1944 were in New Jersey, with 11,712 acres; Massachusetts, with 11,355 acres; New York, with 10,316 acres; and Pennsylvania, with 8,764 acres. These lands were irrigated chiefly for vegetables, cranberries, fruits, and flowers. There has been also a substantial amount of such irrigation in the eastern portions of the Carolinas and in Michigan and Wisconsin.

Approximately 1,600,000 acres of rice are irrigated in Louisiana, Arkansas, and eastern Texas. The extent of this operation places it in a somewhat different class from other types of humid-area irrigation. Many rice farmers in soil conservation districts, however, have adopted farm conservation plans which provide for improved water application, along with necessary drainage to get the water off at harvest time. Pasture-management practices also are involved with rice growing in this section.

Another large and important section relying on humid-area irrigation lies west of the Cascade Mountains, principally in Washington and Oregon. A large variety of crops is grown in this area under irrigation; included are improved pastures, truck crops, and special crops grown for seed.

Development of practical and efficient portable sprinkler systems has been a major stimulus to irrigation in humid areas. Such systems are well suited to irregular topography not normally irrigable by gravity methods. They are easily removed from fields to facilitate farming operations. They also fit into conservation farming by permitting proper crop rotations and contouring practices. Both dairying and beef production respond to pasture irrigation.



Increased economic returns from crop protection in recent years have encouraged the trend toward this type of irrigation. When farmers can sell their crops at good prices it pays to irrigate, as well as to follow other practices that assure any marked increase in yields. Severe and recurring droughts, one of the worst hazards of farming in humid areas, can be effectively dealt with by portable sprinkler irrigation.

Assistant Secretary of Agriculture Knox T. Hutchinson, at a meeting of the Darlington County, S. C., Agricultural Society, said recently that humid-area irrigation can "drought-proof" your farm up to a certain point.

Increased income derived from one or two truck crops has sometimes more than paid for the cost of an irrigation system. The availability of irrigation water for truck crops permits a farmer to time his farming operations so as to have his crops ready to meet the most profitable markets. For example, he can irrigate a dry field and after a day or two plant young cabbage or other crops and quickly get a good stand—in timely adjustment with market prospects. Irrigation can thus be employed at will to meet the exigencies of drought.

Take peaches, for example. Here is a fruit that requires ample moisture at the right time, and timely irrigation will sometimes reduce unseasonable frost hazards to the peach crop.

Irrigation of pastures has been of growing importance. Farmers need green pastures during all the growing season. Conservation pasture practice not only calls for the most adaptable grasses and legumes and good all-round pasture management, including fertilizers, but for timely irrigation also. Some grasses, however, like bluegrasses, do not do well in hot weather, even where moisture is plentiful; they often get tough and less palatable.

In the Pacific Coast States, the Soil Conservation Service finds that around 600 pounds of beef are produced on good irrigated pastures as against gains that seldom exceed 250 pounds per acre on dry pastures. Dairy farmers have found that irrigated pastures enable cows to give more milk during summer dry spells. Many farmers in soil conservation districts have found that irrigation of pastures more than pays for itself.

Need for expert technical assistance becomes evident from the simple questions of the farmer who is considering irrigation. He may ask, for instance,



**Sprinkler irrigation of new alfalfa seeding on the Keller and Price farm in the Clark-Skamania Soil Conservation District, Orchards, Wash.**

"How often will I need to irrigate?" In New York State, it was found that under some conditions, several applications of irrigation water—sometimes a half dozen or more—may give good results.

Trained technicians are needed to help farmers with their irrigation problems, whether in high- or low-rainfall areas. Rainfall records are needed, of course, to determine the probabilities with respect to drought frequency. Also, optimum requirements of crops for moisture must be known. Moisture-holding capacity of soils has to be considered, also. The time, rate, and amount of water application are important factors, too.

The farmer must know the capabilities of his land and the availability of water on his own farm. How much water can he get from his streams, ponds, wells, or springs? In other words, he must know not only how much water he will need but how much he has. The Soil Conservation Service technician working with the local soil conservation district will tell him what kind of distribution system will be best for his farm.

Adequate technical assistance will include an inventory of the suitability of the land for irrigation. It is highly important to apply water when needed, in the amounts needed, and so as to avoid waste and prevent erosion. When all required information is at hand, the system must be carefully designed. And after a system is installed, it still must be operated properly.

The Soil Conservation Service is providing this kind of technical assistance, cooperatively through soil conservation districts, for thousands of farmers. Some of these technicians have spent their entire careers working in the field of irrigation.

They understand water and the land's need for water. They know the latest results of research, the best grasses for different parts of the country, how to prevent erosion, and other techniques of modern soil and water conservation.

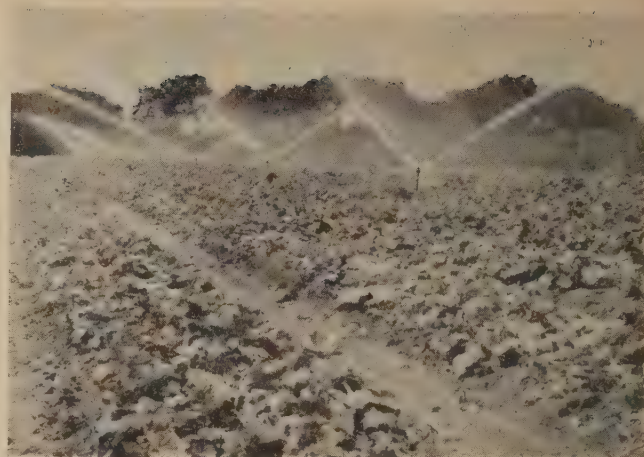
An increasing number of commercial firms handling sprinkler equipment are doing a good job of designing improved mechanical features. Such designing covers adaptation of pumps and engines to different conditions, sizes of pipes, pipe fixtures, and sprinkler heads.

Humid-area irrigation has become an integral part of the program of many soil conservation districts throughout the United States. The humid area is generally considered as that land east of approximately the ninety-seventh meridian and on the Pacific Coast west of the Cascade Mountains. In this area land preparation for irrigation improvements increased from a very small start about 1946 to 110,047 acres in the fiscal year 1951 and the total land thus improved to June 30, 1951, amounts to 257,263 acres.

An example of irrigation under humid conditions is the South Tillamook Soil Conservation District in Oregon. After the district was established in 1940, one of the first actions of the supervisors was to initiate a program of improved irrigated pastures. The first step was to improve drainage. Tide gates previously constructed had to be lowered and rebuilt. New drains were dug in places, and dikes were repaired. With the assistance of Soil Conservation Service technicians, 200 of the 261 farmers in the district went ahead with their conservation program.

Because dairying is the chief agricultural enterprise in this district, conservation farming covers pasture improvement. Sprinkler irrigation and proper management of pastures largely account for the good record of the district's program. Establishment of adaptable, high-yielding pasture grasses and legumes was an early and important part of the work. Native pastures were plowed, cleared of brush and trees, leveled, and planted to temporary pastures. This permitted time for rotting out of the cumbersome tussocks and preparation of a better seedbed for long-time pastures. Irrigated pastures were seeded to tall fescue and Ladino clover.

In the South Tillamook district the annual rainfall exceeds 90 inches. Why irrigate with such a high rainfall, one might ask. The answer would



Portable sprinkler system irrigating cucumbers on Thornhill farm, in Charleston County, S. C. Two or three additional pickings are made possible.

be: The long summer dry seasons, lasting from late June to early September. Irrigation is needed during this period for the lush forage called for in high milk production.

Thirty-eight percent of all farmers in the district use sprinkler irrigation; outside the district only 11 percent of the dairy farms are so equipped. Based on creamery records, district farmers produced 14.7 percent more butterfat on an average during 1942 to 1948 than was delivered in 1941. On the other hand, farmers outside the district produced 10.5 percent less during 1942 to 1948 than in 1941.

Water management has played an important part in the Charleston County, Georgetown, and Williamsburg Soil Conservation Districts in South Carolina. In this area the land is prevailingly flat and often nearly level. Rainfall is higher and drainage is a first essential to good agriculture. After the land is drained, many farmers provide water-control and overhead irrigation to assure ample moisture during drought periods. On a considerable number of vegetable farms, ground excavations have been made to save drainage water taken off the land following rainy spells, which is pumped back on the same land as irrigation water.

On the Copohee farm near Mount Pleasant a sprinkler irrigation system is used. Here a half to three-fourths of an inch of water applied at precisely the right time has sometimes meant the difference between crop failure and a good vegetable crop, sometimes grossing more than \$1,000 an acre. Included in the Copohee system are two



reservoirs of a million gallons each. These supply water for the sprinkler system. They are filled from drainage ditches and runoff. Such storage and use of fresh water were resorted to only after water from deep wells of the locality was found to contain too much salt.

On Yonges Island, S. C., good results have been obtained from both gravity irrigation and portable sprinklers. Reservoirs and shallow wells supply the water for the farm of C. C. Garrity, a cooperator with the Charleston County Soil Conservation District. Depressions fingering up from the sea in this area have been converted into storage reservoirs to good advantage.

A striking method of managing water is seen on the Greenfield Plantation, not far from Georgetown, S. C. Here it has been found that an inch or two of water at the right time can save a crop. Underlying the topsoil and a sublayer of clay is a deep layer of sand. Subirrigation is obtained through this sand layer by lateral dispersion from the ditch. To control the water level, 7 miles of main canal, laterals, and farm ditches were dug. These provide drainage when there is too much water and subirrigation when there is too little. The subirrigation is accompanied by a system of gates installed in the ditches to raise the water to the necessary level for forcing it out through the sand layer during droughts.

On the west coast and in other parts of Florida this same principle of subirrigation is frequently employed in vegetable production.

Soil Conservation Service experience shows that good results with humid-area irrigation are generally derived from vegetables, fruits, pasture, and specialty crops where otherwise, moisture deficiencies cause frequent losses—in those places water can be obtained at reasonable cost.

Results with irrigation in high-rainfall areas have not all been uniform. Failures have sometimes resulted from excessive wet weather, deficiencies in plant nutrients, weeds, insects, and plant diseases. Considerable research is still needed to develop most effective methods of irrigation under humid conditions.

The effects of humid-area irrigation may prove important even for growing corn. Our technicians, working in cooperation with the Alabama Agricultural Experiment Station at Auburn, report that in 1950 a sprinkler-irrigation plot produced 101 bushels of corn per acre, as compared with 49



**Irrigation equipment—pond, pump, and pipes—on the Burton Froberg farm in Washington County, R. I., cost \$3,000. Maximum water use in 1950 was 250,000 gallons per day. That year increased hay production resulting from irrigation amounted to 25 percent, or 1 ton per acre. An even more spectacular performance was on schedule for 1951.**

bushels per acre on a similar nonirrigated plot. Nine inches of water were applied to the irrigated plot, in addition to the 13.7 inches of natural rainfall during the 1950 crop season. A hybrid corn, thinned to 20,000 plants per acre, was used. At the time of planting, 800 pounds of 0-14-10 fertilizer were applied. On June 1, anhydrous ammonia was applied at the rate of 120 pounds of nitrogen per acre, followed by an application of nitrate of soda on June 15 at the rate of 120 pounds of nitrogen per acre. Irrigated and check plots received the same preparation, fertilization, and cultivation. If such yields of corn can be made consistently on suitable lands in the South, irrigation will have an even more important place in the agriculture of the region.]

As agricultural problems are solved through research, field trials, and operational experience, it is likely that humid-area irrigation will require the development of new and better methods and many additional surface- and ground-water supply sources or installations. The availability of adequate water, in addition to the many needs for water other than for irrigation, is one of the most pressing problems for further study. Widespread increase in the use of water for irrigation may make it necessary to consider possible changes in State laws governing water use.

Irrigation in humid areas is now a part of the responsibility of the Soil Conservation Service. It is a growing and integral part of full soil and water conservation. It offers an opportunity to add to our Nation's crop production, to provide better control of erosion and runoff, and to round out our national program of soil and water conservation, to the benefit of all.

## DISTRICT PROFILE

W. F. HALL  
of  
GEORGIA

**F**RIENDS say that W. F. Hall, of Sparta, Ga., is more interested in helping his fellow man than he is in helping himself.

If you look only at the record of this lumberman-farmer in soil conservation district activities, you'll see ample reason for such a statement. But Hall also is a leader in church, civic-club, and Boy Scout work, in boys' and girls' club activities, and in veterans' and fraternal organizations.

It would be impossible to learn all the contributions in time and money that Hall has made, and is making, to better living, to greater opportunities for youth, and to improved church institutions. When he is asked for his help with a project he considers to be for the welfare of his community, Hall's reply almost invariably is: "I'll do it if you won't tell anybody about it."

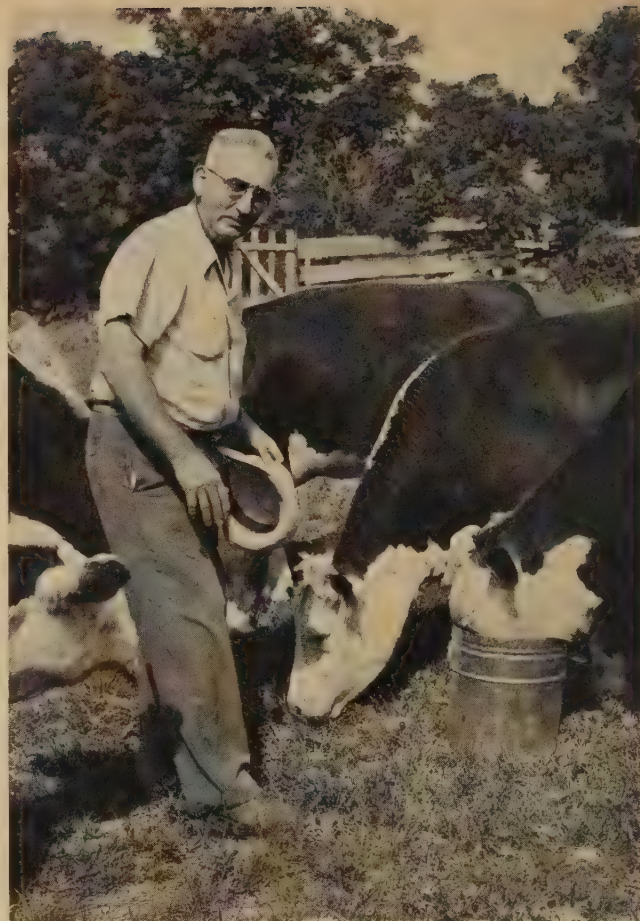
To the dismay of his closest friends, the Georgian refuses to let either his business or his health interfere with his soil conservation work in his own Piedmont Soil Conservation District, in the State, the Southeast, and the Nation.

When soil conservation district work began to keep him away from his W. F. Hall Lumber Co., he called his keymen together. He told them something like this:

"Soil conservation is more important to our people than anything else. If we take care of the land, all of us will live better. We will have better churches and schools and roads. Our rising generation and all future generations will have opportunities that you and I did not have. Further, we must be good stewards of the land and water resources that God gave to us. I have been given an opportunity, through districts, to help save and improve the land. If you run this business well, while I'm away, you will be making it possible for me to help with soil conservation, and that will be your contribution to this cause."

Hall laughingly says his planing mill and saw-mills do better while he's away than when he's in the office or the woods.

But sometimes problems arise that his men think Hall alone can solve. That happened while he



Hall and registered Polled Herefords.

was in Memphis, Tenn., last February to attend a Department of Agriculture meeting on the Secretary's order No. 1278 coordinating the Department's soil and water conservation work.

Told by telephone in Memphis of a difficulty at the planing mill, Hall replied: "This meeting is terribly important. Just shut down the mill until I get home." But when he returned to Sparta, he found the planing mill running, the problem already solved.

Hall became a supervisor of the Piedmont Soil Conservation District when his friend, Private Banker Marvin Pound, resigned from the district board in 1947. Pound urged Hall's appointment, because he knew Hall was a soil conservationist at heart. The lumberman already was carrying out a good soil and water conservation program on his own land as a district cooperator.

Soon Hall was active in the State Association of Soil Conservation District Supervisors. In 1948 he was named association president. The following February he organized and led the South's



largest delegation of supervisors to the annual meeting of the National Association of Soil Conservation Districts in Denver. While much of the Midwest was blanketed by snow and ice from severe winter storms, the Georgians talked green pastures and green fields in their home State and in the Deep South. Atlanta's invitation for the 1950 National Association convention was accepted.

If you were in Atlanta in February 1950, you know how well the Georgia supervisors and their friends in Atlanta, Macon, Perry, Fort Valley, Mansfield, and Thomaston prepared for what proved to be the National Association's biggest convention up to then. Three times as many delegates went to Atlanta as to any preceding convention. And the story of the South's soil and water conservation work, its winter grazing, and its green cover crops was spread over the Nation, as Hall knew it would be.

At the Atlanta convention, the Sparta lumberman-farmer was elected Southeastern vice president of the National Association—a busy, payless job which he still holds. Believing that all people will help the districts if given an opportunity, Hall has taken the leadership in the Southeast in getting the National Association's Program for Greater Service started. He discussed this program at annual meetings of State associations in Florida, Georgia, Mississippi, South Carolina, North Carolina, and Virginia last fall and winter. A meeting of the National Association's executive committee kept him from going to the Alabama convention, and icy weather prevented his attending the Tennessee session.

When Hall is away on district affairs, he knows that his farm, as well as his lumber business, is in good hands. His brother-in-law, J. C. Clarke, and he are partners in the operation of the 2,850-acre farm they call Hamburg.

A whole-farm soil and water conservation program is nearly completed on Hamburg's hills and valleys. W. N. (Red) Watt, SCS technician, helped develop the plan. More than 1,800 acres are in protected and managed woodland.

"We haven't had a fire in the woods in the nearly 5 years that I've been here," Clarke said.

Of the 850 acres of open land, 450 are in cotton, small grain, annual lespedeza, corn, velvet beans, and blue lupine, grown in a conservation farming system. Open land not suited for cultivation grows

pasture for a commercial herd of Herefords led by registered bulls.

Hall was a pioneer in his district in the planting of tall fescue and Ladino clover for permanent pastures. He planted 40 acres in 1945 when a 5-acre patch was considered unusual in most parts of Georgia.

Hamburg also has a 214-acre lake on Little Ogeechee River. Hall finds relaxation on the lake and in the stream, where he takes bass (locally called trout), redbreast, warmouth, and jack with his fly rod. In the bobwhite quail season you frequently can find the lumberman-farmer and his bird dog Rex hunting in the wildlife field borders and bicolor lespedeza seed patches.

Hall's "home farm," nearer Sparta than Hamburg, is entirely in permanent pasture—all 112 acres of it except the home site and a 2-acre fish pond. On Ladino clover, fescue, sericea, crimson clover, Bermuda-grass, annual lespedeza, and kudzu he has a herd of registered Polled Herefords. Hall's 14-year-old daughter Sylvia, a 4-H Club member, has a cow and calf.

Recognition, as well as hard work, has gone to W. F. Hall as a result of his wide interest in community affairs. He was awarded the Silver Beaver, highest honor given by the Boy Scouts of America. He represents the Central Georgia Council in the National Boy Scout Council. Once Hall was chosen a master farmer by the American Legion. He is a member of the advisory council of the United States Forest Service in Georgia. He teaches a Sunday School class in the Baptist Church. He is a member of the Georgia State Soil Conservation Committee, composed entirely of district supervisors. He is chairman of the Hancock board of county commissioners.

Each year he gives a prize to the club boy growing the most corn on an acre. The prize is \$1 a bushel, and one year he paid the winner \$115 in a county where the corn yield averages only 14 bushels per acre.

Hall has served as president of the Lions Club, commander of the American Legion post, district Legion commander, and master of his Masonic lodge.

But he is best known in the State, the Southeast, and the Nation as a soil conservation farmer and district supervisor.

—GORDON WEBB



# BASIC TRAINING for YOUNG FARMERS

By ROBERT W. OERTEL

**I** NTEREST in land capabilities has been whetted among vo-ag students in the Macon County (Ill.) Soil Conservation District as a result of a recent land-capability judging contest.

This contest was sponsored as part of the district's Program for Greater Service.

The purpose was twofold: (1) To acquaint FFA and the public with the concept of land capabilities and (2) to provide a teaching medium for instructors of vocational agriculture.

Note.—The author is district conservationist, Soil Conservation Service, Decatur, Ill.



Ervin Runion, of Warrensburg, Ill., sights through ordinary hand level to determine slope. His companion is Bob Drake, of Niantic, Ill.



Robert Skinner, Argenta, Ill., measures depth of topsoil while Leland Ruch, Maroa, Ill., records his observations.





**John Mangis, work unit conservationist, holds land-capability map while the author explains official version.**

Teams of six FFA boys from each of the seven different high schools in Macon County participated. Contestants were scored on their ability to rate various factors shown on a land-capability map furnished by the Soil Conservation Service.

In addition to rating physical land characteristics, contestants were required to make the land-capability classification, select the best land use, and determine a suitable crop rotation and the conservation practice necessary for each of six locations on the contest field. Slope and practice limitation charts were used to determine the most intensive cropping systems suitable for different soil, slope, and erosion-control practices.

Details of the score card were determined by a committee consisting of Melvin Nicols, vo-ag instructor; Warren Myers, farm adviser; Frank Purnell, extension conservationist; and Robert W. Oertel, district conservationist.

After the score cards were graded, the district conservationist accompanied each vo-ag instructor and his class on a field trip to demonstrate land capabilities. Nearby farms of district cooperators were visited because land-capability maps were available for use. These field studies made it possible for teachers and students to gain a better working knowledge of the subject.

The real value of the contest is well summed up in the words of Mel Nicols, vo-ag instructor at Maroa High School: "The time spent in preparation for the contest is the time of real benefit. All my students gained a real appreciation of land capabilities on their own farms. The contest itself was primarily a test of their training."

All of the vo-ag instructors were enthusiastic over results.

# REPORT ON PROGRESS

By WELLINGTON BRINK

**T**WO hundred fifty years after Antoine de la Mothe Cadillac set foot on the site of what was to become Fort Pontchartrain, and later Detroit, a group of modern adventurers called Friends of the Land assembled high up in a city hotel for the purpose of taking another look at our much-abused but still incredibly rich countryside.

Where lay in 1701 the swamps and creeks and rivers, the untouched woodlands and prairies and pine-fringed beaches, now rise the brick and steel forests of teeming industry. The freighters of the Great Lakes and the sleek wagons-on-wheels have taken the domain from the Red Man—but the conquest of soil and timber and water continues to this very day.

The early explorers might find it difficult to recognize the trails they blazed for God and France. But they did blaze trails, and they did open up the land that now supports the Twentieth Century, and provides the highest standards of life and living ever known to this planet Earth.

The victory has not been without cost. From one rugged edge of the Continent to the other, the Age of Discovery was followed by the Age of Exploitation. By fire and plow, by ignorance and avarice, the natural treasure was looted and the early beauties were despoiled. Generation after generation took their toll, and the country felt the losses of its basic resources.

Then came the quickening of conscience, the national awakening. Uncle Sam's brow furrowed with worry as the gullies deepened and the effects of the erosional process became increasingly apparent. A reversal of heart and mind and activity ensued, and a slow, arduous national soil conservation movement got under way aimed at restoration, rehabilitation, and permanent usage of the land according to its capabilities.

It has been something like two decades now since the American people first bestirred themselves. Farmers, scientists, technicians, and almost every segment of the public have found ways to join in the concerted effort to safeguard the American soil and put it to its highest permanent productivity.

Signposts everywhere tell us that progress has been made. Farming on contour is an everyday sight. Increased yields, enhanced farm incomes, added tax returns, proclaim a rural prosperity beyond anything previously enjoyed. Schools, churches, libraries, highways, all reflect the better times that have come from soil and water conservation. And yet, the biggest part of the job is still ahead.

It was to see just where the Nation stands with regard to its natural resources—to take inventory, to appraise and evaluate—that Friends of the Land met in Detroit in September. The important aspect of this initial day of accounting is the fact that it opened up an important new series of annual even as unique in its department as the series of institutes on conservation, nutrition, and health, which is sponsored by the same organization. As the lay scorekeeper, the coordinator for the public, Friends of the Land has found another useful role for service.

Jonathan Forman, veteran vice president, presided at the daytime sessions, September 25, and stated the aims of the conference. Hugh Bennett, Chief of the Soil Conservation Service, with chart and map traced the progress of soil conservation—progress which shows the conservation job completed, up to the stage of maintenance and improvement, on 21.4 percent of the Nation's farm land needing protection and not including the "spread" of practices on many individual farms for which records are not available. Bennett also noted that some soil conservation districts already are planning to celebrate soon the 100-percent completion of their basic programs; that 16 districts have finished more than 80 percent of their work up to the stage of maintenance and improvement; that approximately 150 districts have completed 50 to 97 percent, and that approximately 300 have finished 25 to 50 percent.

Other speakers included D. Howard Doane, of Agricultural Service, Inc.; Arthur Hawthorne Carhart, author of "Water—Or Your Life"; Samuel T. Dana, professor of Forestry, Filibert Roth University; Russell Coleman, president of the National Fertilizer Association; and Clyde Williams, director of Battelle Memorial Institute.

Paul B. Sears, head of the Department of Conservation, Yale University, at a dinner meeting summarized the conference discussions. Highlight of the occasion was the presentation of the highest

award of Friends of the Land—the Hugh Hammond Bennett gold medal for outstanding contribution to conservation. The recipient this year, the second year offered, was Louis Bromfield, Lucas, Ohio, vice president of the society and famed for his novels and also his writings on Malabar Farm. The presentation was made by Bennett himself, who declared that Bromfield "has blended the dramatic information acquired on his own acres with the outpourings of his own heart and soul. As a result, he has reached millions of men and women who had never been reached before, and greatly shortened the time that will be required to get the soil conservation job done."

## BOOKLET BRINGS FRIENDS TOGETHER

(Continued from page 98)



Front cover of new booklet.

The booklet outlines in considerable detail what the farm-equipment dealer can do to cooperate with the local soil conservation district.

Most farm-equipment manufacturers are obtaining copies of the booklet for their dealers. The Farm Equipment Institute also is making copies available to district supervisors.

Waters S. Davis, Jr., president of the National Association of Soil Conservation Districts, announced: "The Association plans to give complete support to farm-equipment dealers in this conservation effort.

"I am sure that soil conservation district officials will welcome the valuable assistance of dealers as members of the local advisory committees through which each district carries out its Program for Greater Service. It's a good alliance. The FEI is to be congratulated on the leadership it has taken."





This improved pasture is a typical result of conservation farming in the South Tillamook Soil Conservation District.

## EIGHT YEARS OF PROGRESS IN DAIRYING

By VERNON W. BAKER

**I**RRIGATION where the average annual rainfall is over 90 inches? Incredible, you say? It is not incredible at all to farmers in western Oregon's noted Tillamook cheese-producing area. Here it has proved an important factor in the program of the South Tillamook Soil Conservation District calling for better use of its land resources. This program has resulted in boosting butterfat production nearly 15 percent over the period from 1941 to 1948.

While this increase was taking place inside the district, butterfat production in the remainder of Tillamook County which was without benefit of a

conservation program declined about 10 percent. Significantly, 38 percent of all the dairy farms in the district had sprinkler irrigation systems. Outside the district only 11 percent of the dairy farms had sprinkler systems.

But why irrigation in an area receiving nearly 8 feet of rain annually? The answer lies in the fact that, despite this seemingly excessive amount of moisture, normally only a very small part of the rain falls during late June, July, August, and early September. Nature, therefore, requires assistance to maintain a lush pasture growth over the long growing season in an area devoted almost entirely to dairying.

Dairy products make up more than 83 percent of the total value of all farm output here in Tillamook County. They are marketed cooperatively through the Tillamook County Creamery Association. This parent organization until 1949 was made up of 16 local community associations, each with a cheese factory and plant which served as the milk-receiving station for the farms in the vicinity.<sup>1</sup> By means of these local cheese factories, it is easy to compare the production from farms within the South Tillamook Soil Conservation District with that from farms in the rest of the county. This comparison is summarized in table 1, following.

Note.—The author is an economist and soil conservationist with the Soil Conservation Service, Portland, Ore. This article is based on a leaflet prepared by Mr. Baker, "Community Gains from Conservation Farming."

<sup>1</sup>The Tillamook County Creamery Association opened a new modern central plant late in 1949.



TABLE 1.—Comparison of butterfat production from farms within the soil conservation district and from farms in the rest of Tillamook County, 1940-48<sup>1</sup>

Year	Butterfat production within the district				Butterfat production in rest of Tillamook County			
	Butterfat delivered to factories	Part of county total	Increase over 1941 production		Butterfat delivered to factories	Part of county total	Decrease from 1941 production	
	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent
1940	1,186,226	32.0	-----	-----	2,518,733	68.0	-----	-----
1941	1,363,743	31.8	-----	-----	2,929,895	68.2	-----	-----
1942	1,439,296	33.5	75,553	5.5	2,851,332	66.5	78,563	2.7
1943	1,424,199	35.8	60,456	4.4	2,552,650	64.2	377,245	12.9
1944	1,558,742	37.4	194,999	14.3	2,606,431	62.6	323,464	11.0
1945	1,627,843	37.8	264,100	19.4	2,678,071	62.2	251,824	8.6
1946	1,595,127	39.8	231,384	17.0	2,411,342	60.2	518,553	17.7
1947	1,669,194	38.4	305,451	22.4	2,673,736	61.6	256,159	8.7
1948	1,632,786	38.8	269,043	19.7	2,577,639	61.2	352,256	12.0
Total	13,497,156	36.2	1,400,986	14.7	23,799,829	63.8	2,158,064	10.5

<sup>1</sup> Data taken from records of the Tillamook County Creamery Association.

The soil conservation district includes only about 32 percent of the dairy farms and about 27 percent of the county's agricultural land.

The seeming paradox of sprinkler irrigation along one of the wettest parts of Oregon's rain-drenched coast is only part of the story of what soil conservation has meant to district dairymen. While important in the production gains of the last decade, it nevertheless had to wait the development of numerous other features of the district's conser-

vation program. Let's go back to the beginning.

Early in 1940 the farmers in the lower Nestucca Valley and the Sand Lake areas of Tillamook County voted to organize the South Tillamook Soil Conservation District to do something about their land problems. Not only did they lack sufficient moisture during the summer months but they had far too much during other seasons.

For years they had been troubled with poor drainage of wet lands along the narrow coastal



Improved, irrigated pastures are the primary reason for the steady gains in butterfat production in the South Tillamook Soil Conservation District.



valley bottoms and tide flats, despite the existence of three different drainage districts dating back to 1919 and 1920. Poor drainage meant low-producing native grasses, tussocks, and other vegetation which could tolerate these wet conditions.

The five district supervisors were quick to take action towards solving this problem. One of their first tasks was to improve the major drainage facilities. The tide gates of the old drainage districts were lowered and improved. Main outlet ditches were cleaned out or reconstructed. New drainage ditches were dug, and dikes repaired. These major improvements made possible the more effective planning and development of drainage and other conservation needs on the individual farms. With the main ditches and outlets in condition to cope with the excess water, individual farmers were encouraged to proceed with the district's program on their lands.

Some 200 of the 261 farmers in the district entered into agreements with the district to carry out soil and water conservation plans on their farms. Since dairying is the chief agricultural enterprise, the primary use of the agricultural land is for pasture. A program of conservation farming consequently is largely one of pasture production.

Establishment of adapted, high-yielding pasture grasses was one of the first objectives. As rapidly as the drainage problems were improved on the bottom lands, native pastures were plowed up, cleared of any trees and brush, leveled, and seeded to temporary pastures of ryegrass, red clover, and alsike clover. This permitted time for rotting of tussocks and the preparation of a better seedbed for improved, long-lived pastures. Permanent pasture seedings varied with irrigation and soil drainage of bottom lands and hill lands. Irrigated pastures were seeded to Alta fescue and Ladino clover. Meadow foxtail or Alta fescue and big trefoil were used on the wetter bottom lands. Alta fescue, orchardgrass, white clover, and English ryegrass were used on the well-drained bottom lands. Non-irrigated hill lands were seeded to Alta fescue, orchardgrass, English rye, creeping red fescue, and subterranean clover.

Sprinkler irrigation and management of these pastures became the most important factors in the high forage yields obtained after the establishment of the improved grasses. A fertilizer program was instituted. Rotation grazing, occasional clipping of the older growth, and scattering of droppings



**A dragline digging a drainage ditch through an unimproved pasture. Poor drainage is indicated by heavy growth of tussocks just beyond the machine and by the scattered clumps in the foreground.**

helped to improve yields. Needless to say, these improved pastures hold an important advantage over lower-producing pastures in paying the costs of a sprinkler system and other management practices.

Silos are being used more and more to utilize the excess forage growth in the spring when Nature's impetus to the growth rate is greatest. Attempts to make hay at this time of year usually result in spoilage because of weather conditions. Grass silage provides a succulent dairy feed during the winter months and cuts down on the amount of hay needed in the ration.

Fourteen percent of the dairy farms in the district had one or more silos in use by the end of 1948. Most of them had been built since 1945. By contrast, only 9 percent of the dairy farms outside the district had silos.

The district's program has been an important factor in stimulating cooperators to carry on more scientific methods of farming. Better use of land resources has increased the farmers' interest in better management techniques. Increased forage supplies have developed more interest in scientific feeding. A primary goal is to provide herds a well-balanced dairy ration with a minimum of purchased feeds.

Herd-improvement work has gone hand in hand with efforts toward better feeding. Greater interest and activity in this work has been shown by the farmers in the district than in other parts of the county. Dairy-improvement work encompassed 22 percent of the herds in the district during 1948, as reported by the association tester, contrasted to 13 percent of the herds elsewhere in the county. One result of this work and of the more abundant for-





Mowing and loading flush-season grass for ensilage during late June on the T. G. Larson farm, South Tillamook Soil Conservation District. This pasture is grazed regularly throughout the season.

age has been an increased tendency to raise more of herd-replacement stock from proved producers, rather than to purchase cows from outside the county. All these things have contributed to greater and more efficient production.

Already, the progress achieved under the district's program is a definite mark of its profitability. Since the original South Tillamook Soil Conservation District was created, the district has been enlarged five different times by petition of farmers who at the time were situated outside the boundaries. In 1948 the remaining agricultural lands of Tillamook County were voted into a newly formed North Tillamook Soil Conservation District. By the end of 1950, 85 farmers were cooperating with the new district. The farmers of Tillamook County have proof that conservation farming pays.

**SLUG MENACE ENDED.**—Snail-like slugs were causing a great deal of trouble at the Soil Conservation Service nursery at Tucson, Ariz. The slugs were crawling up the sides of the boxes and destroying plants that were being grown for wind-breaks on irrigated farms in soil conservation districts in Arizona and New Mexico.



This is how the wire is placed around the top of the box.

Edward H. Morris, in charge of technical operations and propagation work at the nursery, and other employees, were staying up nights trying to curb the activities of the pesky slugs, but with little success.

Poisons which would kill other pests failed to affect the slugs. The mucous secretion spread by the slugs made them immune to the poison. Eventually, Morris picked up the idea of rigging up an electric wire that might kill the slugs and prevent them from damaging the nursery stock.

The device is simple. A wire is run around the top of the plant box and is hooked up to a power line with a converter for an electric fence being used as a safety precaution.

When the slug comes into contact with the electric wire, there's a sizzle and no more slug. The nursery employees now can spend their nights in peace, knowing that the slugs are not damaging the plants.



Morris and device for slugging slugs. The electric-fence converter makes the current safe for all except the intended victims.

**NEW TEETH IN SOIL LAW.**—Under a new law that became operative in Massachusetts on August 30, the penalty for removal of topsoil, loam, sand, and gravel from land not in public use is increased from a *maximum* of \$20 for each offense, to a *minimum* of \$50 for first offense, a *minimum* of \$100 for second offense, and *not less than* \$200 for each subsequent offense. It is designed to halt the commercial traffic in topsoil from agricultural land. Difficulties in making the former enactment effective had been prevalent, particularly in Plymouth County. Contractors there successfully attacked a local bylaw, when the town of East Bridgewater sought to prevent them from moving 10,000 cubic yards of topsoil—more than 2,000 average truck-loads—that had been stripped from farm land and piled there during the waiting period between passage of the original act and its effective date. The issue has been appealed by the town from the superior court to the supreme court.



# THE RESPONSE OF PLANTS TO WATER

By PAUL B. SEARS

**M**AN cannot live without plant life, and as population presses more and more heavily on the land, vegetable material forms an ever larger proportion of the human diet. Fossil fuel from plants furnishes most of the energy for modern industry, while the growing demand for plastics, newsprints, oils, and building materials means constantly heavier drain upon plant products.

Even the most casual knowledge of history reveals how profoundly the course of civilizations and the forms of culture are influenced by plant life and the patterns of world vegetation. It is no accident that bread, wine, corn, and other fruits of the soil have a sacramental meaning for the world's great religious faiths. Yet by a curious inconsistency the science which deals with plant life is a Cinderella among the sciences taught in most schools and colleges, except those of forestry and agriculture.

The welfare of the plant kingdom is the welfare of man himself.

Among the requirements for plant growth none is more vital than moisture. Yet I suppose that most failures in the simple art of growing house plants are due to failure to recognize this fact. Certainly a major problem in the growing of crops is to have an adequate supply of moisture in proper balance at the proper time.

The older geographies divided the world very simply, by means of great circles, into temperature zones—cold at the poles and hot at the equator. No question about it, temperature is important to all forms of life. But when, little more than a century ago, men began to study the mosaic of forest, grassland, and desert which covers the face of the earth, the great circles which belted the maps proved almost useless. Plants had not been taught geography. In North America the belts of forest and

grassland ran north and south, not east and west.

At first it was thought that rainfall might be the cause, and of course it is important. But as we learned to measure and map rainfall, that idea was exploded. Twenty inches of rainfall in Canada produces forest, in Mexico desert. We know now that evaporation, a process which the weather maps do not yet show, is fully as important as rainfall. Net profit is not determined by income, but by the relation of income to expense.

But evaporation is not the only source of expense in the water budget. Unless the soil is well supplied with organic matter, protected and held in place by a firm cover of vegetation, the loss of water through runoff is vastly increased. And it is fair to say that man's activities too seldom replace the natural vegetation with a cover which protects the soil and retards runoff.

Ohio and Iowa are conceded to be two of the greatest and best agricultural States in the Union. I have just traveled through both. I saw much of Ohio in company with three master farmers. We tried to estimate the proportion that is under the highest type of land use and management, and considered 10 percent to be a generous guess. One man said that in his own county, with some 2,000 farms, he knew of just one that would fill the bill. Incidentally, it was his judgment that production on the remaining 90 percent could be not merely doubled, but tripled by proper use and management. No small part of this increase would be due to a more favorable water budget, although many other factors are involved.

In Iowa we saw a similar situation, masked somewhat by the immense depth of topsoil and its great fertility. The type of agriculture there is largely extractive, with a minimum of grass-legume mixtures that approximate a natural cover. The problem here is largely one of intelligent water regulation—avoiding the danger either of too much or too little. I have been asked to speak in New Jersey next fall on the water problem, and when the local situation was explained to me I sent back the title, "Wet Cellars and Dry Bathtubs." The water problem is Nation-wide, and no respecter of rainfall maps. Much of the trouble is of our own making.

But my real assignment today is to report to you on a historical study we have been making for the past 2 years in our neighboring country of Mexico. This study, I believe, shows how sharply human activity can be limited by the availability of mois-

Note.—Dr. Sears is professor of conservation, Yale University, New Haven, Conn. This paper was presented at the most recent Conference on Conservation, Nutrition, and Health held under the auspices of Friends of the Land at Chicago.

ture. The purpose of telling it is to remind you that mankind is, after all, pitifully dependent upon nature. His hope, in spite of the false prophets, is not to conquer nature, but to follow her guidance and survive by complying with her uncompromising laws.

This idea is in danger from two sources. One source is highly respectable and scientific. Technologists, ignorant of biology but tremendously successful in solving problems of energy and mechanics, may feel that, no matter how deeply we become involved, they can work out an ingenious solution. The other source of danger lies in those who either know nothing of science or merely pay it lip-service. This group feels that man is an exception in the order of nature, and needs only cross his fingers and say "Kings-X" to get out of any jam. Promise such people the moon winningly enough and they fall in line as the rats of Hamelin town followed the Pied Piper. It is for their protection that we have to exercise some ethical control over advertising, quack doctors, and the like.

But back now to the beautiful Valley of Mexico, whose queen city was built on the bed of a lake, filled with hundreds of feet of sediment that had accumulated during the thousands of years. Just as the dusty floor of a cave, or even the waste heap of a city, contains the layered records of the past, the muds of this lake have their story to tell.

From the forest-clad mountains which surround the valley, clouds of yellow pollen have each year descended upon the waters of the ancient lakes, to be embalmed in its mud and preserved to the present time. This pollen comes chiefly from oak and pine, two kinds of trees which are in eternal competition for space. Moisture favors the spread of oak, while dryness throws the advantage of battle to the pine. Thus it happens, with an astonishing simplicity, that the records of long alternating periods of drought and moisture are preserved. We need only to drill down through the sediments and count the relative proportions of these two kinds of pollen to obtain the record at successive levels. This we have done back through the last interglacial period.

We have found that, throughout this long expanse of time, periods to be measured in centuries or millenia have been marked by deficient moisture. Separating them there have been prolonged times of fairly abundant moisture. These findings have been beautifully confirmed by our studies in northern New Mexico.

Some 4,000 years ago the Valley of Mexico was occupied by a clever and teeming population known to us as the Archaic culture. We have been able to connect our studies of fossil pollen with the pottery and figurines left by the Archaic people, and with old lake levels and rich black soil as well. All of the evidence agrees that their activity began and was carried on during a time of relatively abundant moisture.

But the end of the Archaic, uncovered by the recent drainage of Lake Texcoco, was at a time of low water level. Our studies show that the climate was then very dry. At this time there was a heavy fall of volcanic ash, affording a marker which has enabled us to extend our studies many miles in various directions. Everywhere the record is the same—the ash fall came during a very dry period which lasted for a long time thereafter. And during this dry time, from about 500 B. C. to about 800 A. D., there seems to be little trace of much human activity in the heart of the valley.

But gradually, as our records show, the climate became moist once more. The lakes, too, filled up. A great system of human activity, the Nahua, was once more established. Through its effective use of the lake margins in gardening, and the lake waters in fishing, it built up such vitality that by the time of the conquest, the Aztecs, a Nahua people, were overlords of much of Mexico. At the time of the conquest, the ancient city was surrounded by lakes and gardens, and there the Spaniards built their City of Mexico.

But this low-lying city was subject to floods. To get rid of floods, the conquerors began to drain the lakes which were the lifeblood of the economy. The process was not completed until about 1900. Two years ago, while working in the dry bed of Lake Chalco, I counted over twenty dust storms at one time. As the afternoon wore on these grew and merged until the air was filled with choking, impalpable dust—dust which had been fertile lake bottom until the beginning of the present century. And the village of Xico, which had been a prosperous garden center, trading by canoe with Mexico, was a pitiful and desiccated rural slum.

During the long dry period between 500 B. C. and 800 A. D. when, as I have mentioned, there was little activity in the heart of the valley, a great religious center was built on higher ground far to the north at Teotihuacan. This had commerce with moister lowlands across the mountains, eastward to-



ward the Gulf. But I surmise that it also had sources of underground water, now gone. The late Professor Vaillant thought that this community eventually perished because the hills above it were deforested for fuel. Professor Cook of California has shown that heavy soil erosion took place at the height of activity in Teotihuacan. The vast pyramids, abandoned, I believe, before the advent of the Nahua, remain for all to see. The larger has greater mass than the pyramid of Cheops in Egypt, and is almost as high.

The moist period which ushered in the Nahua civilization is evident in our own country and certainly extended into the nineteenth century. But since 1850 there has been a perceptible rise in temperature, which means, of course, less available moisture unless rainfall has increased, which it has not. Glaciers in our mountains and in Alaska, which had built up during the preceding centuries, have been receding since about 1850.

What this may mean in the decades to come I cannot say. But the pattern of the past is clear. Periods—long periods—of reduced moisture follow long periods of abundant moisture, and we may well be at the beginning of a long period of increased climatic hazard. Even if we are not, the experience of the past two decades, the insistent and growing thirst of our civilization is a matter we cannot ignore.

I have used our Mexican neighbors, for whom I have the greatest fondness and respect, as an example. But let us not forget how our own actions rendered the High Plains vulnerable to drought in the 1930's. Nor let us forget that the same type of speculative, extractive land use which ushered in that disaster is once more under way.

## HOW BANKERS MAY HELP

By LOUIS P. MERRILL

**R**ECENTLY we were asked, "What can bankers do to help soil conservation districts?"

This question came from J. C. Porter, who was once a district conservationist with the SCS, and now is director of the agricultural department

Note.—The author is regional director, Soil Conservation Service, Fort Worth, Tex.

of the First National Bank of Wichita Falls, Tex. One of Porter's jobs is to help correspondent banks with their agricultural programs.

Out of Porter's simple inquiry came a number of pointed suggestions, among them the following:

1. Become thoroughly acquainted with the soil conservation district set-up so that there can be no confusion or lack of understanding in the minds of all bank employees as to what a district is, what it is supposed to do, how it operates, and how it differs from all other agencies, organizations, and groups that are working full time or part time on the conservation of our soil and water resources. Until this is fully understood, no effort to help in the district's program can be completely effective.

2. Acquaint the bank's clients and prospective clients owning or operating farm land with the need for soil conservation, the benefits of a coordinated conservation program, and ways to obtain help in planning and applying such a program through the soil conservation district.

3. Know the supervisors of the district, where they live, when and where they meet, so that an inquirer or client may be referred to a local supervisor or to the board as a whole.

4. Encourage clients who are district cooperators or prospective cooperators to get acquainted with all the supervisors and to help them carry out the district program, showing them that their active participation is needed.

5. Be acquainted with district activities so that you can talk convincingly with farmers and ranchers who may be interested in adopting soil conservation programs. Knowing the increase in crop yields, and other specific benefits from conservation farming or ranching, is one of the best means of getting others interested. Talk about *profits* in conservation.

6. Know exactly what help a cooperator or ACP participant can obtain from the Soil Conservation Service, the PMA, and other agencies, so that the prospect will not be led to expect more than can be delivered, or be discouraged by being told he will get less help than is available.

7. Encourage district cooperators and prospective cooperators to work together in neighbor groups, as an effective means of getting more conservation work done with their pooled resources.

8. Organize a committee representing all banks in the soil conservation district to work with dis-

trict supervisors, meeting jointly at regular times.

9. Encourage newspapers, radio stations, and businessmen to organize in similar fashion, all to meet with district supervisors on conservation matters of mutual concern.

10. Participate actively in field tours, using bank displays and other means of advertising the event.

11. Plan to include soil conservation in regular newspaper advertising, timing each advertisement to the season.

12. Award cash prizes annually for the best essays on soil conservation in grade and junior and senior high schools of the district.

13. Sponsor an annual get-together dinner with supervisors, newspaper editors, radio-station managers, businessmen, and others. Present cash awards or savings bonds to the best conservation farmer and group in each zone of the district.

14. Finance by secured loans the purchase of seed, trees, fertilizers, and equipment, especially when the lack of such items is holding up conservation.

15. Show continuing interest in your client's progress toward becoming a conservation farmer or rancher. Make an occasional visit to your client's farm or ranch, so that you can discuss his conservation program on even terms.

16. Explain to applicants for farm loans why your bank will lend more money on a conservation farm than on a nonconservation farm. One banker, W. T. Andrews, vice president of the Spur Security Bank, Spur, Tex., says: "On the average 160-acre farm in our trade territory, we could make a loan of around \$100 to \$200 before the district started conservation work several years ago. Today we can loan this man from \$500 to \$600 if he has a good conservation program, and feel just as secure."

17. Explain to clients in the business and professional field the value of the district's program to them and to the whole community. As Andrews observed: "Soil conservation has, in my opinion, increased our production in the Spur trade territory one-third, and it has made credit more secure for our bank."

18. Initiate bank displays of conservation pictures and other material. This should be done by bank personnel so that they will become familiar with soil conservation and recognize their part in it.

19. Print copies of "how to do it" conservation job sheets, with photos, to illustrate soil conservation practices.

20. Finance the printing and distribution of a promotional folder for the district, making it attractive in appearance and easy to read.

21. Read the annual report of the district and discuss it at a meeting of all bank employees.

22. In regular contacts with district supervisors, find out what important soil conservation practices are lagging and then plan a campaign to popularize these practices.

23. Promote any special activity that will advance the soil conservation program, increase the general income and welfare of the community, and center attention on the district program. For example: In an Arkansas community, a cheese plant was an important factor in the economy, but the plant ran full time only in the summer because milk production lessened in fall and winter. The bank met with district supervisors, chamber of commerce representatives, and SCS technicians. They worked out a plan of small bank loans for pasture improvement, to achieve year-round grazing. Chamber of commerce members endorsed the loans. There was no defaulting. Other farmers, seeing what was going on, financed their own pasture improvements. Now the cheese plant runs full time the year around. The farmers are better off, the workers in town are better off, the bank is better off, and the businessmen are better off.

24. Emphasize the profit and importance of large yields on suitable land over small yields on larger acreage that might involve endangering the soil through improper use.

25. Learn, proclaim, and explain, at every opportunity, the fundamental principles of soil conservation: Use the land within its capabilities, and treat it according to its needs. Once that principle is understood and followed, the conservation of our soil and water resources is assured.

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**GOT YOUR FARM PLAN HANDY?**—A practical answer to the question of how well farmers keep up with their farm plans was provided in Noxubee County (Miss.) Soil Conservation District when fire destroyed the 238 copies of plans in the work unit office. R. M. Currie, work unit conservationist, hustled around and picked up 184, or 77 percent of the plans, from farmers themselves. Thirty-nine were replanned from land-use maps, and 15 were canceled because of change in ownership.



# RAISING PRODUCTION ON AN ARIZONA FARM

By WILLIAM G. WILLIAMS

**F**RANK WILLIAMS changed the channel of the Santa Cruz River to keep stream-bank erosion from destroying his valuable farm land. He also used conservation practices to restore abandoned or severely eroded fields to profitable production. Williams cultivates 200 acres in separate tracts near the base of "A" Mountain on the southwest edge of Tucson, Ariz.



Some of Williams' calves on alfalfa pasture.

He came to Arizona in 1930. Today, Williams operates the "A" Mountain Dairy and sells at wholesale the milk from 125 cows. In addition, there are 30 heifers and calves. There are alfalfa, barley, hegari, Sudangrass, and bur-clover for the livestock. The manure goes to improve soil fertility. In "spare time" Williams operates a very modern grocery store and filling station.

In the last 20 years, Williams has bought, improved, and sold several tracts. He is constantly on the lookout for means of improving the productivity of his land. In May 1946 he signed with the Pima County Soil Conservation District and since then has had the help of SCS technicians.

One of the first jobs Williams tackled was stream-bank erosion. With each heavy flow the meandering Santa Cruz River was stealing some of his best soil. Already, the stream had cut about 50 feet into one field for a considerable distance. Williams knew it would be difficult and expensive to halt this process single-handed.

Note.—The author is soil conservationist, Soil Conservation Service, Tucson, Ariz.

The riverbanks along this area revealed heavy deposits of gravel and sand, and there were good markets for both. Williams did the logical thing. He contacted a construction concern and agreed to sell it the gravel and sand. The company made the first removals from a 1,450-foot strip that would provide a new channel for the river. This was done and the Santa Cruz now has been flowing beside Williams' field for more than 2 years without causing any further damage.

"It's like eating your cake and having it, too," says Williams. "The sale of the gravel and sand not only provided a new channel for the river, but afforded a profit also, and I'm still selling gravel."

Williams takes pride in guiding visitors over his several pastures and explaining just what has been done to get each up to its present high productivity. One of his pastures was once operated as a vegetable farm by a Japanese farmer. It became severely eroded and was cut by numerous deep gullies. Almost everyone except Williams considered the land worn out and didn't believe it ever could be made productive again. Williams filled the gullies, leveled and fertilized the field, and put in a new irrigation system. Today, this is one of the most productive of his several pastures.

Still another pasture—this one of 13 acres—has been built from wasteland. It had been abandoned.



Fish pond stocked with bass, bluegills, and catfish.



Frank Williams testing flow of irrigation water on his farm near Tucson.

First, Williams cut the trees that had grown up on this undulating tract. The land was so uneven that it had to be leveled in benches, and even this necessitated cuts and plenty of fertilizer. This former wasteland now provides an excellent alfalfa pasture.

This is where Williams plans to build his new home soon.

One tract of 4 acres is located where it was necessary to build a siphon under the river in order to get irrigation water to the land. The tract was heavily infested with mesquite, which had to be cleared. Mesquite usually is piled and burned when land is being cleared, but Williams had a better idea. He had it cut up for wood which he sold for enough to pay the cost of leveling. This formerly "worthless" land now carries a fine stand of alfalfa.

Williams has a 7-acre pasture near his present home where he is trying out sprinkler irrigation. This is about the only spot of his 200 acres that hasn't been finished-leveled, and he believes this may not be necessary since the grain is doing well and the field is easy to irrigate.

Also included in Williams' holdings are some of the old and abandoned wells which once served the

Flowing Wells Irrigation District. Today, the tops of the old wells protrude from a narrow oblong pond which has been stocked with bass, bluegills, and catfish.

Wells provide irrigation water for all of Williams' land. In carrying out his soil and water conservation program, he has leveled practically all of his land, concrete head gates have been installed, irrigation ditches have been realigned for more efficient use of water, fertilizer is being applied continually, and rotated grazing is practiced. He also plans to line some of his irrigation ditches with concrete or to install concrete pipes to carry the water.

"The use of conservation practices has enabled me to get poor land into profitable production, has doubled yields on the better land, and provides a big saving in water, time, and labor," Williams declares.

**DON'T BEAT YOUR SOIL TO DEATH.**—Too much tillage is harmful to arid soil in Arizona. Karl Harris, SCS irrigation engineer at Phoenix, recently reported the results of some tillage tests on the University of Arizona experimental farm at Safford. For some time it has been noted that disking, floating, and other tillage operations used to prepare a seedbed decrease the intake rate of water that enters the ground and consequently make it more difficult to get a deep penetration of moisture. It has also been noted that crops do not grow so rapidly or yield so much in areas in front of gates or in turn rows where farm machinery has been over the ground many times.

In an effort to determine the effect of tillage on the yield of barley, a test was made on the Safford experimental farm. It was planned to prepare rough tillage with the conventional method of seedbed preparation. Also included was a comparison of the effect on the yield of barley of two qualities of water.

Sixteen plots were used. Half of them were irrigated with water from the well on the university farm, which contained 4,017 parts per million of total soluble salts. The others were irrigated with water from the Gila River, which is very low in soluble salts. The experiment was modified slightly in the spring of 1951, due to the fact that no water was available in the river for irrigation, and it was necessary that the last two irrigations on all plots be made from well water containing salt.

The plots were laid out so that two adjacent plots were rough-tilled, the next two plots conventionally tilled, and so on. Of the eight plots left rough, four were irrigated with river water and four with salt



water, and the same method of irrigation was given the conventionally tilled plots.

The only work done on the rough-tilled plots was to plow the land several months before planting. The seed was broadcast on this rough-plowed land and irrigated up. The plots using the conventional-tillage method were plowed several months before the barley was planted, then disked and harrowed before it was pre-irrigated. After irrigation, the land was again disked and harrowed, and planted. Other than preparation of seedbed, both treatments were exactly the same; that is, they were planted at the same time and irrigated at the same time.

From the time the barley started to grow, it was apparent that the plants on the rough-tilled plots were much healthier and of a darker green than those on the conventionally tilled plots. Where the salty well water was used, the rough-tilled plots produced two and one-half times more barley than the conventionally tilled plots. Where river water was used, the difference in yield was not nearly so great; however, there was a decided increase in yield of the rough tillage over the conventional method. A very important result of this test was the fact that the yield on the rough-tilled plots using the salty well water was about the same as that of the conventionally tilled plots using the river water.

The conventional method of tillage costs approximately \$8 more per acre than rough tillage. If \$8 per acre were saved on all the land planted to grain in Arizona, it would result in a tremendous saving. And if the saving in seedbed preparation were added to the returns from the increased yield under rough tillage, this one crop alone would pay many times the cost of all of the research in the State of Arizona.

When handling the arid soils of Arizona, keep tillage operations at a minimum.

—GEORGE D. CLYDE

### SOIL CONSERVATION

"Some of the towns in this area, backed by law, restrict the sale and removal of topsoil from farm lands from which the towns derive taxes.

"Allen Benjamin of the State planning board will explain the laws, also the significance of the laws to future generations, at a meeting of the Plymouth County Soil Conservation District on Friday at A. R. Parker's, East Bridgewater.

"Test cases have been heard in Brockton district court. Brockton's alert and competent farm bureau agent, Mr. Brown, has gone on the air over WBET to give the public information about the laws.

"The issue isn't whether a man has a right to sell his own property. Be it said he owns a farm. It took hundreds of years and the chemistry of na-

ture to create the fertility which makes topsoil productive.

"Has he a right to impoverish the land, the community, and future generations by depriving them of a natural resource not of man's making?

"No one has a right to impair or destroy natural and real wealth. Though despoliation has been practiced—standing timber, one instance—it has been wrong.

"A community has a right to protect what belongs to the future as well as to the present—topsoil."

—From the *Brockton* (Mass.) *Enterprise*.

**HALF MILLION FOR EQUIPMENT.**—The Division of Soil and Water Resources of the Kentucky Department of Conservation has spent \$500,000 from its revolving fund for soil conservation equipment. The division was created in 1946 to assist districts. The equipment is being amortized as it is used to get soil and water conservation practices applied.

### NOTES FROM THE DISTRICTS



**HELPING HANDS.**—When ex-Marine Frank Flees, Marathon County (Wis.) Soil Conservation District, lost an eye while filling a silo, his friends dedicated a "Good Neighbor Day" to help him. About 200 farmers and friends worked on 25 projects, which included building a house and barn, preparing 25 acres for alfalfa, renovating 10 acres of pasture, digging a pond, clearing stones, and planting trees.

**BETTER THAN TAXES.**—The towns of Buckfield and Canton, in the Oxford County (Maine) Soil Conservation District have entered into agreements with the district through which tax-delinquent lands will be converted into town forests—revenue producers. Eventually, it is expected that these towns will receive a much larger income from this land than they would have received in taxes if the land had remained in private hands. Work in Canton will start in 84 acres of mostly open fields where 2 to 3 acres of seedlings will be planted annually.

**TREES AGAINST THE WIND.**—Farmers in the Sherburne County (Minn.) Soil Conservation District speeded up windbreak planting to keep their sandy soil from blowing away. About 2,400 cuttings from an SCS experimental shelterbelt were plowed in as the first start on a cutting nursery. Varieties included European poplar and two bush types of Ural willows. Recent inspection showed nearly a 100-percent survival.



**KNEW CONSERVATION WHEN HE SAW IT.**—

One morning in mid-August this summer, a large bus pulled into the Coshocton, Ohio, Soil Conservation Service experiment station. As the passengers began alighting, I hurriedly looked over my calendar. No tour scheduled! The bus driver, who seemed to know exactly what he was about, came directly to my office.

"I have brought you some visitors from Fairfield County Farm Bureau Council No. 11," he said. "Each year the families of this council schedule a bus for an all-day tour. They select two or three points to visit and leave the rest to the driver. I have been over here three times with chartered tours of Ohio State University students and I told these Fairfield County folks that you had something very interesting to show them."

I replied that it would be a pleasure and an opportunity to receive his group. So, during the next 45 minutes in the meeting hall and 45 minutes in the field, these folks were given information on the magnitude of soil erosion and water loss, the effect of conservation farming, and the principles of soils, water, and land management.

When the visitors left, many of them said they would like to return some other time for a longer stay. I thanked the bus driver, Paul Hickey of Columbus, and asked him to bring other groups whenever circumstances permitted.

—LLOYD HARROLD

**AWARD FOR TOP TEXAN.**—Beginning in 1952, an annual award is to be presented to the outstanding soil conservation district supervisor in Texas, it is announced by the Texas Bank and Trust Co. of Dallas. This award is to be an all-expense trip for the supervisor and his wife to some chosen area within the United States or its possessions to study soil and water conservation methods.

The winner will be selected through a banker-farmer-rancher tie-up in each district. Each of the 165 districts in Texas has 5 supervisors, all farmers and ranchers. Banks will be asked to nominate the outstanding supervisors in their districts. These nominations will go to zone committees, which will screen the nominations and send one name from each zone to a State Conservation Award Committee, which will select the winner. The State committee will include Claude Jones, Gainesville banker; Paul Walser of Temple, State soil conservationist; Clayton Puckett of Fort Stockton, head of the Texas Association of Soil Conservation District Supervisors; Walter Humphrey, editor of the Fort Worth Press; C. M. Caraway of De Leon, chairman of the State Soil Conservation Board; and P. B. (Jack) Garrett, president of the Texas Bank & Trust Co. of Dallas.

This program is designed to create a better understanding and closer relationship between banker, farmer, and rancher, as farming and ranching are the basis of the Texas economy.

Winning of the award will bring recognition not only to the supervisor but to the district and zone he represents.

**ARMY LAND LEASED.**—When the Corps of Engineers decided to return more than 10,000 acres of the Redstone Arsenal near Huntsville, Ala., to agricultural production, they called in the Soil Conservation Service and the supervisors of the Northeast Alabama Soil Conservation District.

Thus far, 6,727 acres have been leased for 4½ years to 12 farmers with provisions that use be kept within capabilities and that conservation treatment be given according to needs.

About 3,000 acres will be seeded to tall fescue, and the rest will be put in clovers, small grain, or hay.

**NATIONAL CHAMPS HONORED.**—Two brothers, Larry and Grady Torrence, of Baldwin County, Ga., winners of National 4-H Championships in Soil Conservation, were honored at a special program arranged by supervisors of the Piedmont Soil Conservation District. Larry and Grady are sons of Mr. and Mrs. C. W. Torrence, who were among the first farmers in Baldwin County to sign a district cooperative agreement after the Piedmont district was organized in 1939. Larry, who won the 4-H championship several years ago, has since graduated from the University of Georgia with honors and is now serving as a lieutenant in the Army. He was unable to be present for the ceremonies, so the supervisors presented his award, a framed certificate, to his mother and father. Grady won the 4-H Championship in Soil Conservation in 1950. He has completed 128 4-H Club projects and is now Master 4-H Club boy. He entered the University of Georgia this fall.





JANUARY 1952

# Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE



# SOIL CONSERVATION •

CHARLES F. BRANNAN  
SECRETARY OF AGRICULTURE

ROBERT M. SALTER  
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE  
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Editor  
Art Work by  
W. HOWARD MARTIN

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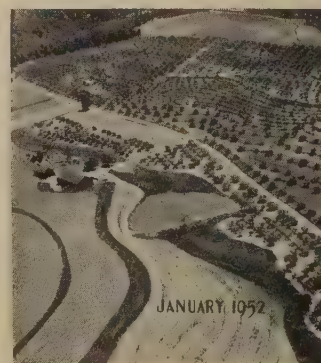
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**PROPERTY AND LIVES CONSERVED, ALONG WITH SOIL.**—To supply transportation to SCS technicians in 2,374 soil conservation districts, a fleet of 1,402 automobiles and 7,376 light trucks is maintained. In the year ending June 30, 1951, SCS automobiles covered more than 16 million miles, and trucks nearly 58 million miles.

Following the close of World War II, the Service fleet was in a run-down condition brought about by attrition due to the war. It was recognized that careful attention had to be given to maintaining what vehicles remained in order to meet the requirements of expanding conservation activities. New vehicles were needed and a program of gradual replacement was worked out.

Also, beginning in 1946, an active program of maintenance was inaugurated. In each region traveling mechanics are employed to inspect each vehicle at least twice each year and to see that it is properly cared for mechanically and as to safety of operation. This program is paying off. Cost of operation and maintenance for the 1946 fiscal year for each mile traveled was \$0.03169 for automobiles and \$0.03861 for pick-up trucks. These costs have been gradually reduced over the ensuing 5 years to \$0.03012 and \$0.03390 for automobiles and trucks, respectively. In view of increased costs of gasoline, oil, labor, and parts, the reduction in cost of operation is all the more gratifying.

(Continued on page 141)



**FRONT COVER.**—This fine air view by Gordon S. Smith shows contoured orchard, diversion terraces, and farm pond on the property of George Follweiler, of Stony Run, Berks County, Pa.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



# SALTER REPLACES BENNETT AS CHIEF

The Soil Conservation Service has a new Chief. As this issue was going to press, announcement came from the Secretary of Agriculture of the appointment of Dr. Robert M. Salter to the command held so many years by Dr. Hugh H. Bennett.

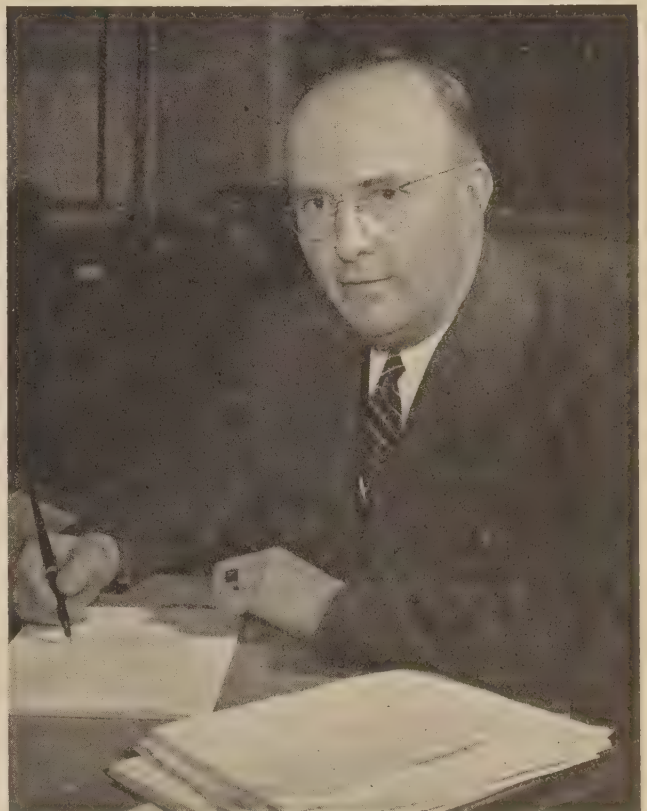
The new Chief is an outstanding scientist and administrator, thoroughly versed in the problems and opportunities of the national soil conservation program. Since 1942 he had been Chief of the Bureau of Plant Industry, Soils, and Agricultural Engineering.

Dr. Bennett will serve as a Special Assistant to the Secretary, in charge of conservation and resource matters.

See the next issue for more details.



Dr. Hugh H. Bennett.



Dr. Robert M. Salter.

## DISTRICT PROFILE

PEARL FREDERICKSEN  
of  
IDAHO

The president of the Women's Auxiliary of the National Association of Soil Conservation Districts is a trim little farm wife who overflows with energy.

She is Mrs. Don G. (Pearl) Fredericksen, who lives near Gooding, Idaho, and grew up on a farm in a nearby community. She was graduated from the St. Alphonsus hospital school of nursing at Boise, and vowed she'd never marry a farmer.

But she became the Gooding County nurse and met Don. She's a blonde with a modish bob, and she manages to keep her nails manicured even though she does all manner of farm work in addition to her housework.

Mrs. Fredericksen, a vice president of the Women's Auxiliary of the Idaho Association of Soil Conservation Districts, was elected president of the National Association auxiliary at the Oklahoma City convention last February. Fifty-two wives of district supervisors, representing 23 States, were present at the organizational meeting.

Mrs. Fredericksen has great hopes that the 1952 convention of the National Association will give impetus to the ladies' auxiliary. She is corresponding with women of several States. They have made arrangements to have business sessions and a luncheon for all wives who accompany their husbands to the Cleveland meeting. Mrs. James Lane of Xenia, Ohio, is in charge of the distaff side of convention arrangements.

Mrs. Fredericksen has two primary goals. The first is to get ladies' auxiliaries organized in each State and through them to get auxiliaries functioning in each district. The other goal is to help improve the educational work in soil and water conservation. In this endeavor she is not only thinking of working with schools and colleges, but also with State departments of education and women's groups, both rural and urban.

"Farming is more of a whole-family effort than almost any other business I know," said Mrs. Fredericksen, "and I think every one of us farmers' wives should know what soil conservation is all about.

"We have no intention that the auxiliary will



Mrs. Pearl Fredericksen.

take over any function of the State or National District Associations, but we feel we can assist them to get everyone in the Nation acquainted with soil conservation. Our efforts, I believe, will be in the field of education."

Mrs. Fredericksen is a good friend of Mrs. Frank Goodwin, of Sweet, Idaho, president of the Idaho ladies' auxiliary, which was formed because several wives who always accompanied their husbands to the State meetings wanted to do more than go on tours and play cards. The Idaho auxiliary was the first to be formed. Washington now has such an organization and so does Minnesota, where it is known as "Daughters of the Soil."

The Fredericksens live on the place to which Don moved with his family in 1912. At that time what is now a flourishing farm was only a sagebrush flat. It is in the "Magic Valley" section of south central Idaho.

Mrs. Fredericksen became interested in soil and water conservation through her husband, a tall strapping fellow with a flashing smile.



Fredericksen was one of the organizers of the Gooding Soil Conservation District and has been chairman of the board of supervisors since it was created.

The Fredericksens have more than half of their 400 acres of irrigated land in grass-legume mixtures for pasture and hay. Don enthusiastically advocates the use of grass with alfalfa for hay. Some say that the initial "G" in his name stands for grass. They follow their farm conservation plan with a rotation of 4 years of hay, 1 year of grain, 1 year of beans, and 1 year of grain with a new seeding of hay.

Under their conservation plan the Fredericksens were able to make a great deal more efficient use of their supply of irrigation water. This was achieved by precise leveling of the fields to be irrigated, improvement of water distribution, and applying only the amount needed to wet the root zone.

The saving on water permitted the Fredericksens to irrigate 35 more acres than formerly.

The Fredericksens are livestock raisers. They have approximately 200 head of whitefaces which are grazed on Federal grazing land and some 2,000 acres of private and leased land in the summer.

Don and Pearl are active in community affairs. Don is a member of the draft board and the school board. He is president of the Thorn Creek Cattle-men's Association, Inc. He is a Mason and an Elk, and Pearl a member of the Eastern Star and the Elks ladies' auxiliary. They helped raise funds for the Gooding Memorial Hospital, a 35-bed structure built while Don was a member of the hospital board.

Still a registered nurse, Mrs. Fredericksen confines her activities in that field mostly to nursing her friends when they're hospitalized. She delivered five babies of neighboring farm wives shortly after she married Don, including a set of twins. The neighbors customarily say, "Phone for the doctor and get Pearl to rush over."

Pearl loves the outdoors. She fishes with others of the family in mountain streams, lakes, and the Snake River. Every fall she goes hunting with her husband for deer, antelope, and elk. They make their camp in Idaho's rugged Selway Primitive area. She has her own big-game rifle with telescope sight.

There are two sons, Gene, 10, and Bob, 13. The boys are 4-H Clubbers with baby-beef and hog projects.

She laughs when she tells about her birthday and Mother's Day gifts this year from her boys. She received a pair of waders, a fishing creel, and a new fly rod—all the youngsters' own idea.

She's a typical farm wife in many ways. On occasions, she and the boys milk their 10 dairy cows. In harvest season she's in the field and can operate all of the farm implements. She doesn't hesitate to pick up a shovel and help set the irrigation water. But above all she has that one typical trait of neighborly farm women: She's a wonderful wife and mother who is entirely unselfish and will do anything for her neighbors and friends.

—J. BOYD PRICE

### **BIOLOGY TEACHERS LAUNCH PROJECT.**

The teaching of conservation in biology courses will be encouraged by the National Association of Biology Teachers under a 3-year project to be conducted with the assistance of a grant-in-aid from the American Nature Association.

The association, through State chairmen and committees, is now gathering descriptions of outstanding programs already in use. The committees particularly want to know how various teaching techniques have been used to increase interest in conservation, such as field trips, films, camps, school forests, nature trails, use of community resources and agencies, group work, school-ground projects, fairs, exhibits, and so on. Local, State, regional, and national workshops are planned to permit biology teachers and others to develop adequate criteria for good teaching, to share experiences, organize descriptive material submitted by teachers, and to assist in developing projects and programs in schools interested in initiating a stronger conservation program.

A national committee, consisting of the State and regional chairmen, and an executive committee of 7 will guide the project and be assisted by an advisory committee of representatives of 25 national conservation groups.

Anyone willing to assist in the project in any way, or knowing of biology teachers who are doing an outstanding job in this field, are requested to write to Dr. Richard L. Weaver, Project Leader, P. O. Box 5424, State College Station, Raleigh, N.C.

**TO KEEP INFORMED.**—Funds have been voted by the board of directors of the Tehachapi (Calif.) Soil Conservation District to provide each farmer within the district with a 1-year subscription to SOIL CONSERVATION Magazine.

On July 1, 1951, this district included 138,350 acres in Kern County, distributed among 242 farms. Roy E. Ballard is the work unit conservationist.

# A NEW GROUND COVER FOR SANDY SOILS

By R. Y. BAILEY



**Bahiagrass made vigorous top growth and another crop of seed, which was harvested. This heavy growth of grass is evidence of the value of the clover residue on this sandy field. The photograph was made last August.**

**W**E have a lot of land in both the Atlantic and Gulf Coastal Plains that is too sandy for most pasture grasses. This is often called poor sandy land. Recent developments in the use of Pensacola Bahiagrass and reseeding crimson clover show that much of this poor land is good, if we use it right.

We learned several years ago that Pensacola Bahiagrass would survive on poor sandy soils. The forage was good for spring grazing, but got coarse and tough later in the summer. As Oscar Hurst, a farmer in Florida, expressed it, Pensacola Bahia was a yellow grass. This farmer learned after applying nitrogen fertilizer that Pensacola Bahia was a *green* grass. Our problem then was to supply enough nitrogen to make this a green grass.

Reseeding crimson clover sown on Pensacola Bahiagrass sod at Soil Conservation Service nurseries at Americus, Ga., and Thorsby, Ala., made good late winter and spring growth. After clover seed ripened in the spring, the grass made vigorous growth. The grass was green and succulent and the green color remained into the fall.

Clover came back to thick stands in the fall, if grass tops were mowed and removed for hay. Where very dense grass was mowed and left on the ground, clover came up only in narrow strips where the divider board on the mowing machine pushed the grass aside and exposed the soil surface. This was useful information to guide us in the management of a Bahia-crimson clover combination under farm conditions.

While we were learning from plantings of clover on Bahiagrass at the nurseries, farmers were making plantings of their own. Russell O'Barr, work unit conservationist in the Yellow River Soil Conservation District, Crestview, Fla., wanted something better than pale, yellowish Bahiagrass. He talked with J. D. Warner, vice director in charge of the North Florida Experiment Station at Quincy. When Warner told O'Barr that he thought crimson clover was a good legume for that section, O'Barr believed him. In fact, believing in J. D. Warner is the usual thing in that part of Florida.

O'Barr's next job was to get some farmers to plant reseeding crimson clover on Bahiagrass. C. F. Manning called on O'Barr for help in planning the use of some cut-over pine land. In the early

Note.—The author is regional research representative, Soil Conservation Service, Spartanburg, S. C.



summer of 1949, the scattered pine trees, gallberry bushes, and other woody growth were cleared off and a seedbed prepared. Early in the fall, Manning sowed a mixture of Pensacola Bahiagrass and reseeding crimson clover. The land was limed and fertilized. Crimson clover furnished late winter and early spring grazing in 1950. Cattle were removed in the spring and a crop of clover seed was harvested. Following the clover-seed crop, Bahia-grass made a good seed crop. After harvesting seed, Manning pastured the grass. He did not have enough cattle to keep the grass grazed closely and it had a heavy top growth by fall. This top growth was mowed and removed for hay. A thick volunteer stand of clover came in the fall.

Several other farmers in this district went along with O'Barr and tried some of the Bahia-crimson clover combination. G. C. Johnson, Baker, Fla., sowed Pensacola Bahiagrass seed in the spring of 1947. He sowed reseeding crimson clover seed on the surface, without covering, in late October 1947. He pastured both clover and grass in 1948 and each year since. His dairy cows take the grass tops off closely enough in summer for good stands of clover to come in the fall. He got thick stands of volunteer clover in 1948, 1949, and 1950. The clover residue left on the land each spring made his summer grass deep green in color. His dairy cows grazed the Bahiagrass right on through the summer. Johnson has not harrowed the soil since the initial planting in the spring of 1947.

John Senterfitt, Laurel Hill, Fla., sowed Pensacola Bahiagrass seed in May 1947 and sowed inoculated crimson clover seed on the undisturbed ground surface in late October of the same year. The clover was grazed in the spring and allowed to make seed. Bahiagrass was grazed in the summer and fall. Clover came back in thick volunteer stands in 1948 and 1949.

Senterfitt had too many cattle for his acreage of pasture and they grazed the clover so closely in the spring of 1950 that the seed crop was light. He got another good stand of clover that fall, but was short of feed and grazed the pasture so closely that the clover made little growth. He increased his acreage of this mixture and also added a field of Argentine Bahiagrass so that in the future he can manage his pastures properly.

C. B. Johnson, Geneva, Ala., followed a different plan of seeding grass and clover. He sowed reseeding crimson clover on 42 acres of good Class I and

Class II cropland in November 1948. Cattle grazed the crimson clover in the spring of 1949 until about April 1, when they were removed to let clover seed mature.

After crimson clover seed was harvested, the land was disked thoroughly during the summer and seeded to Pensacola Bahiagrass in August 1949. The grass came up to a good stand and the seedlings survived the mild winter. Protection by the volunteer crop of crimson clover probably helped to carry the grass seedlings through the winter.

Crimson clover was again pastured until about April 1950 and another seed crop was harvested. Later in the summer of 1950, Johnson harvested 302 pounds of grass seed per acre. Cattle were turned in again after grass seed was harvested, but the pasture was not stocked heavily enough for close grazing. The surplus grass was also mowed with a rotary mower. Even after mowing, the cover of grass was too heavy for best germination of clover seed.

Dry weather and unusually severe cold in late November delayed the clover stand in the fall of 1950. The late stand of clover gave little grazing in the spring of 1951, but a good crop of seed was harvested. Cattle, at a rate of one and one-half mature cows with calves per acre, were turned on the grass after clover seed was harvested in the spring of 1951. After 30 days, cattle were removed to let the grass make a seed crop.

A few farmers sowed Pensacola Bahiagrass seed immediately after it was harvested. Good stands resulted. This method saved cleaning, drying, and other processing of the grass seed. Up until the fall of 1950 when a late November freeze killed seedling plants, it appeared that seed of this grass could be sown almost any time. Seedlings that came up after early fall plantings survived the winters in other years. We don't know how often we may expect winter injury to seedlings. Our experience over the past several years indicates that spring, early summer, and late fall will be the safest seeding dates. Seedlings from spring plantings survived every year. Summer and early fall seedlings were thinned by cold in 1950. Seed planted in late fall did not germinate until the following spring.

The Pensacola Bahia-reseeding crimson clover combination grew well on a variety of sandy soils. Soil conditions ranged all the way from the very best Class I sandy loams to deep, poor sandy soils.



C. F. Manning, Okaloosa County, Fla., harvested reseed-  
ing crimson clover seed in the spring and Pensacola  
Bahigrass seed in the summer of 1950. He pastured  
and mowed grass tops off in the summer and early fall  
to let the clover come back to the thick volunteer stand  
shown in this picture which was made early last May.  
The view shown at the beginning of this article is of the  
summer grass that followed the clover seed crop.

Best growth was on the better soils, but we learned that with proper treatment the poorer soils will grow these plants.

We believe this grass-clover combination has a useful place in a Coastal Plain grazing program. It is particularly promising for the deeper, poorer sandy soils. Grazing results at Tifton, Ga., indicate that Coastal Bermuda is a better pasture grass than Pensacola Bahia for sandy loams and other more productive pasture soils in the Coastal Plain areas. It is the policy of operations personnel in the Soil Conservation Service to recommend Pensacola Bahigrass for pasture on soils that are not well adapted to Coastal Bermuda. We need more exact information about the relative value of these two sandy-land grasses under exactly comparable conditions. Studies that are now in progress at Tifton should give us this information.

What about soil treatment? Farmers who are most successful with this plant combination have one thing in common—they fertilize liberally and regularly. They apply 500 to 1,000 pounds per acre of a complete fertilizer at planting time. This application of complete fertilizer is particularly im-

portant on the poorer soils. A little nitrogen is beneficial to the first-year clover seedlings. They maintain the vigor of volunteer stands with annual applications of 0-14-10, 0-12-12, or similar fertilizers, at rates of 500 pounds, or more, per acre each year. Most farmers apply ground limestone at a rate of about a ton per acre once every 4 or 5 years. They usually apply a little borax with their fertilizer.

This grass-legume combination has good possibilities as a protective sod in crop rotations on sandy soils. The sod gives perfect surface protection and the coarse roots and stems of Bahigrass fill sandy soils with a durable type of organic matter. The green clover, of course, adds a succulent type of leguminous material to enrich sandy soils.

We have plowed several areas of Pensacola Bahia sod at the Americus, Ga., and Thorsby, Ala., nurseries. We learned from these areas that the grass sod should be turned in the summer or early fall in advance of planting the land to a cultivated crop in the spring. Where sod was broken and disked in the summer or early fall, most of the grass was killed. Summer or early fall breaking of the sod also allowed us to grow lupine or some other winter legume for spring green manure. Caley-peas and vetch volunteered after sod was broken at Thorsby. Crimson clover should volunteer in the fall after grass sod is plowed in the summer, but we have not tried it as yet.

Where we left the sod until spring, we were unable to kill the Bahigrass and it interfered seriously with the cultivation of the summer crop. Seedling grass plants that came up during the spring and summer were not troublesome. We are quite sure from our experience that Bahia will not be a pest on cropland, once the old sod is killed.

The effect of plowing under a heavy sod of Bahigrass was noticeable into the second year of cultivation. Partially decayed grass stems were still present in the fall of the second row-crop year. Growth of corn, grain sorghum, and winter legumes was noticeably better following a stand of Bahigrass, Caley-peas, and vetch than it was where legumes alone were turned under. The combination of coarse grass and succulent legumes appeared to give us better results than either plant grown alone.

Bahigrass - crimson clover combinations are being studied in our research program. We want

*(Continued on page 141)*



By HUGH BENNETT and GLENN K. RULE

# MEN AGAINST THE GLADES



Typical scene: State highway 25, bordering canal; the windbreak is Australian pines. Photo by Everglades Experiment Station.

**I**F YOU LIVE in eastern United States and like string beans, lettuce, corn on the cob, sweet peppers, and several other winter-grown vegetables fresh from the soil, you can thank south-Florida farmers for licking some of the tough land, fire, and water problems of the Everglades.

For 40 years men have been struggling with this vast Glades area—its peat and muck lands, drought and fire, sand and rock and water. Across the years it has been subjected, at various stages of “development,” to bog conditions, drainage, drought, flood, fire, legitimate and questionable land sales, and confusion of titles and land values. “You want to think of the Glades,” an engineer explained, “as the biggest, flattest, blackest, sometimes the wettest and again the driest and burningest area you ever saw.” His comment helps explain why early explorers—English, French, and Spanish—hugged the seacoast and avoided the forbidding morass of muck and peat.

If you know your Florida geography, you know the mammoth fresh-water lake with the pleasant name of Okeechobee. Its north shore roughly marks the northerly limit of the Glades; from its south shore the area, as commonly understood, extends approximately 90 miles to the mangrove swamp bordering the Gulf. The lake itself is almost 37 miles from north to south. Apart from

a triangular area on the west coast and a narrow sandy ridge along the east coast, together with a stretch of rock land and marl to the south, the Glades area covers almost the entire lower part of the Peninsula. This vast tract of more than 75 hundred square miles is now included in the Everglades Drainage District. It is one of the largest known bodies of peat and muck in the world.

Geological records suggest that, off and on, Mother Nature was a bit undecided whether or not to leave this part of Florida above or below water. Anyway, back through the ages, she has tried it both ways more than once. Right now the land mass is above water, but not much, for the highest elevation is only about 21 feet above sea level.

The general topographic features of the Everglades are those of a vast flat plain, characteristically treeless and gently sloping to the south and, in the lower portion, to the southwest. From the shore of Lake Okeechobee, where the elevation is about 21 feet above sea level, there is a gradual fall of between 0.2 to 0.3 feet per mile (over a distance of about 57 miles along the New River Canal) to the eastern edge of the Everglades. The natural drainage of the region for the most part followed the southwesterly slope through sloughs whose original trend was in that same direction. This natural drainage system was insufficient, originally, to carry off the rainfall plus the overflow from Lake Okeechobee.

In the southeasterly marl-rock section there are frequent small dome-shaped mounds of peat rising a foot or more above the surrounding wet areas. These are covered with wild rubber trees, myrtle, bay, and other trees, and are known as “kevs.” The larger, timbered mounds in the deep peat area to the north are sometimes referred to as “hammock land.”

Beginning about 1912, the natural drainage was violently interfered with by the installation of an extensive system of drainage canals. Quickly the drainage proceeded to a point where dry conditions prevailed much more frequently, and noticeable changes occurred in the vegetation in many parts of the Glades. The encroachment of myrtle, willow, bay, and fennel are the result of burning off the sawgrass. If fires had been kept out, sawgrass would still predominate.

The frequency of fires has increased greatly. During the annual dry seasons, many thousands of

acres of peat land have burned over. In places the accumulated remains of water-loving vegetation (peat) have burned down to or close to bedrock, lying at depths ranging from 2 or 3 feet to a maximum of about 12 feet. In the practical sense the more severely burned land has little or no further value for agriculture. As roughly estimated, several hundred thousand acres have been thus severely burned, or burned to depths of from 2 to 3 feet or more. The seriousness of the situation is evidenced by three critically important facts: First, the depth to bedrock is generally only about 2 to 6 or 7 feet below the surface; second, the predominant soil of the Glades proper—peat—undergoes rapid oxidation on drying, with subsidence as the disrupting result; and third, in 1915 the proportion of inflammable (when dry) peat land in the Glades ranged, according to findings of the soil survey of the Fort Lauderdale area (probably representative of soil conditions in a large proportion of the Glades area), up to 85.7 percent of the surveyed area of 225,000 acres.

When wholesale drainage operations began around 1912 there was, so far as can be determined now, no clear-cut goal beyond getting the Glades into cultivation as rapidly as possible. Great drainage canals, which were to be the key to rapid development, were put through with much too little consideration of the real capabilities of the land. No attempt at scientific classification of the soils was made until the Fort Lauderdale soil survey (Field Operations, Bureau of Soils, 1915). No land-capability survey was made until the Soil Conservation Service, cooperating with the Florida Agricultural Experiment Station, completed such a survey in 1943, "Soils, Geology, and Water Control in the Everglades Region," prepared by SCS and published by the Florida Agricultural Experiment Station.

These surveys and studies of the region by the Service were begun in 1939 under the Everglades Project authorized by special legislation carrying an appropriation of \$75,000 (Public 159, 76th Congress).

This work in the area had as its most important initial purpose protection of the extensive peat lands (organic soils) from burning and subsidence. This, it was felt, would first call for topographic and land-capability surveys and setting aside blocks of unused land for protection against fire and subsidence by holding water at high enough

levels to maintain a sufficiently wet condition to prevent aeration and burning. From the standpoint of safeguarding the valuable peat lands, this was soil conservation in the very best sense.

In presenting testimony before the Appropriation Committee on the Agricultural Bill (Hearings, Senate Subcommittee on Appropriations, 76th Congress, First Session, pp. 717 to 723, inclusive, April 24, 1939), H. H. Bennett said, in answer to a question as to whether or not the appropriation asked for in Senator Pepper's bill—"For carrying out engineering operations and other . . . measures (including fire control and irrigation construction work to eliminate fire hazards), in the Everglades region of Florida, \$1,000,000"—was primarily to control the fires: "I would consider it primarily a fire-fighting item to begin with but on such a planned basis as to eventually fireproof these soils."

Some of the continuing testimony on this proposed appropriation was as follows:

**SENATOR CHAVEZ:** In dealing with the fire hazard will you still protect the drainage end so that the land can be used for farming?

**DR. BENNETT:** Yes, sir; it would be necessary, Senator, to establish gates in the canals so that you can raise or lower the water table . . . In those areas which are laid aside as reserves until they are needed for cultivation, we would let the water stand . . .

Again, as a matter of interest:

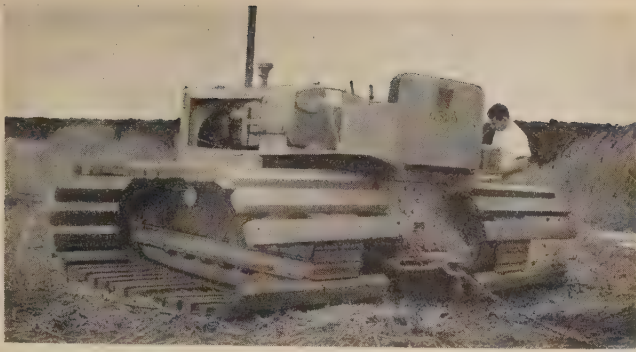
**SENATOR PEPPER:** Now, you think that this \$1,000,000 will be enough to get your . . . program under way?

**DR. BENNETT:** Yes, Senator, I think so. I really think, if I may say so, that probably it would be difficult to spend a million dollars during the first year. I think we should start gradually . . . and feel our way carefully, because it is a new problem . . . a very difficult problem, highly complicated.

\* This was a preview of the situation, with only observations and experience to go on. The preview proved correct, even though the findings of the work have been far more valuable than was foreseen around the great mahogany table there in the Appropriations Room on April 24, 1939.

Twelve years later SCS has not spent anything like a million dollars on the entire Everglades project (\$662,724 has been spent to date), but I would evaluate the worth of the work accomplished at many millions of dollars—to the State of Florida and to the Nation.





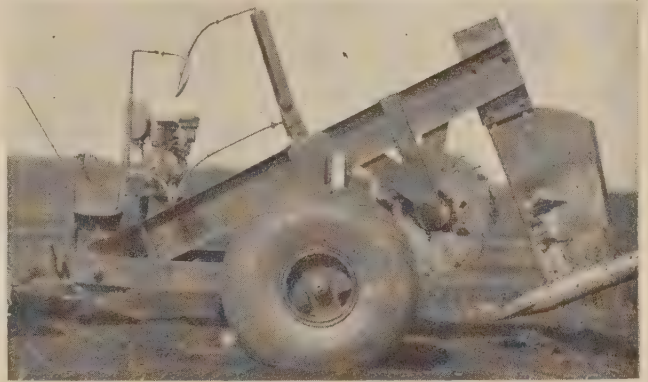
**Wooden lugs are bolted on narrow-gage tractors for travel over soft peat soils. Photo by Everglades Experiment Station.**

In much, if not most, of the agricultural area the principal problem is to provide the right control of water at the right place and time. If the water table is lowered too much by excessive drainage, the area is usually seriously damaged by fire, because the peat, consisting of almost pure organic matter,<sup>1</sup> burns like tinder when dry—and the Glades do dry out on occasion. If, on the other hand, the water table is permitted to remain too high because of inadequate drainage, crops suffer and perhaps die because the feeding zone of plants is severely restricted.

<sup>1</sup>Of 354 samples of "fibrous peat," collected during the Fort Lauderdale, Fla., survey, Field Operations, Bureau of Soils, 1915, 169 contained 90 percent or more of combustible material ("loss on ignition"—but largely organic matter). These samples ranged in depth to bedrock or sand over rock from 18 inches to 11 feet, 8 inches. Only 8 samples of the 354 were as deep as 10 feet, 10 inches, and only 8 were less than 2 feet deep.

Control of water in lower Florida is not the exclusive responsibility or concern of farmers and truck growers. Because of excessive drainage and pumping, the water supply of populous areas has been reported as susceptible at times and in some places to intrusion of salt water.

Water management probably would be less difficult for farmers and drainage engineers if the rainfall were more evenly distributed. While most of the area receives between 50 and 60 inches of rain during the year, a few extremely heavy downpours may account for a considerable proportion of the year's rainfall. On November 6 and 7, 1932, for example, one such rain slashed down 21.22



**Modified moling machine, one of the many special pieces of equipment required. Photo by Everglades Experiment Station.**



**Glades buggy plowing through the hyacinths. Photo by Everglades Drainage District.**



inches in 24 hours at the Cane Breeding Station at Canal Point. Damaging floods sometimes occur when crops are in the ground because of the excessive cost of providing ditches large enough to handle the runoff from the extremely heavy rains. On the other hand, droughts sometimes occur at critical times, making it necessary to irrigate in order to prevent severe crop losses. It is common practice for farmers to pump water out of dike-enclosed fields into the canals during wet periods and to pump water from the canals back into the fields in dry times.

Water control is utterly essential to successful cultivation of the Everglades. In the first place, the predominating peat lands are subject to two kinds of burning, both of which lower the surface of the land. In dry times, these organic soils—some of them containing 90 percent of vegetable matter—burn deeply and persistently, once started by some such misadventure as dropping a lighted cigarette into a crack in the soil. They also burn—more slowly but nonetheless surely—when exposed to the air by cultivation. Hot fire is not involved with this latter process; it is the cold or natural form of burning, called oxidation. This process gradually lowers the surface of the ground by what is called subsidence. Bench-mark records show the rate of subsidence to amount to as much as 5 feet in 40 years.

The Soil Conservation Service was invited to help solve some of the land and water problems of the Everglades region early in 1939; in fact, Congress, as pointed out previously, made a special appropriation for the purpose.

Realizing the importance of the underlying geological formations in relation to water-control problems throughout the Glades, the Service invited the United States Geological Survey to help with studies of the underlying rock formations. As a result, 89 exploratory test wells were drilled in the Everglades territory. Of these, 30 were installed jointly by the Geological Survey and the Soil Conservation Service. Most of the rest were put down by other agencies. The wells ranged in depth from 50 to 812 feet.

In 1943, the Service completed a topographic survey of the area. This was accompanied by a land-capability survey, the two being made concurrently.

This portrait of the land was necessary for guiding its sound use and protection.

The completed survey<sup>2</sup> of the Everglades covers 4,791,294 acres. The various land conditions are covered by five capability types, as shown, together with the individual areas, in the table below.

#### Land Types, Florida Everglades

Land types	Suitability for use	Extent Acres
II	Suitable for cultivation with simple farm practices .....	265,988
III	Suitable for cultivation with intensive practices .....	1,470,956
IV	Suitable for limited cultivation ....	1,784,247
V	Not suitable for cultivation, but suitable for pasture .....	131,805
VIII	Not suitable for cultivation, pasture, or forestry, but suitable for wildlife .....	1,138,298
	Total .....	4,791,294

Until these surveys were completed, Everglades planning for agricultural utilization had to be done without adequate physical facts. It wasn't known, for instance, what the soil consisted of, or what it was good for. No one knew precisely what kind of rock underlaid the soils or how this rock would affect the use of the land.

The capability survey showed, among other things, that much of the Glades area would have to be used for water storage if agricultural operations were to be sound and permanent.

In the first place, where should the necessary water-storage areas be located? Certainly, on land of least value, if such could be used.

The survey has provided the answer to this highly important matter, together with other indispensable information, such as the location and character of the bedrock. Some types of underlying rocks are characterized by an abundance of holes, which make them as permeable to water as a sieve and, therefore, unsuitable as a base for water-retention dikes. Dikes are expensive and must be built where the chance for seepage is least. Part of the underlying rock—the solid variety—is admirably suited as a platform for water-retention dikes.

The soils vary from droughty sand along the outer edges to fibrous peat in the interior, too

<sup>2</sup>"Soils, Geology, and Water Control in the Everglades Region," prepared under the direction of the Soil Conservation Service and published by the Florida Agricultural Experiment Station, 1948. The field work was carried out chiefly by K. Davis, B. S. Clayton, J. C. Stephens, M. H. Gallatin, and A. R. Stephens.





Typical peat fire in the Glades.

coarse for cultivation without first conditioning it by pasturing.

Conventional methods of transportation were attempted in the earlier survey work—that is to say, by foot. Continuous sloshing, knee deep or deeper, through water-soaked peat and muck, was very exhausting, not to mention the dense growth of razor-edged sawgrass, which was uncomfortably abrasive. “Swamp-feet,” followed by peeling, was a common complaint.

On the coastal ridges and sandy prairies ordinary pick-up trucks with oversized tires were satisfactory, but in the southerly and westerly sections where sandy lands are interspersed with sloughs, keys (small hammocks or vegetated hummocks), rock areas, soft marl, and wide stretches of sawpalmetto, transportation called for a “converted” half-ton truck, with heavy-duty rear tires and extra transmission. On the sawgrass peat and muck lands, with frequent clumps of myrtle and “gator” holes, the crawler-type tractor with long cleats proved adequate for the job.

Probably the most notable vehicle for transportation in the Glades proper was the “air boat.” Where water was too shallow for a boat with submerged propeller, and where the peat was soft and deep, these craft propelled by airplane engines proved highly satisfactory. They were used principally in water-covered peat and slough areas. Here they covered the country, with a sensation of “going places” as on an ice sailboat. They were useless, however, on rocky land and land with tree stumps.

The “Glades buggy” with its 3 axles and 12 tires was most in demand for the territory south of Tamiami Trail. But the vehicle most talked about for Glades travel at present is the amphibious weasel, designed during the war for use by the Armed Forces. It was especially useful in soft soils adjacent to ponds or water channels too deep for nonfloating vehicles. One of the surveyors using it said: “It would crawl out of the water, shake itself, and then move off along a hard road at 25 miles an hour.”

Drainage of the Everglades dates back to about 1912. In rapid succession the Miami, Bolles, North New River, Hillsboro, and West Palm Beach canals were constructed to carry water across the Glades from Lake Okeechobee to the sea.

To reduce subsidence and control fires, dikes built of local materials—muck, peat, and rock—are to hold water for keeping unused land saturated. When built of peat, the dikes are subject to subsidence—another factor contributing to the difficulties of water control.

The dikes proposed in the Soil Conservation Service control plans are to be protected with such grasses as Bermuda, maidencane, St. Augustine, Bahia, Para, Rhodes, Carib, centipede, pangola, and others.

The earlier measuring devices used to determine water levels were usually placed near canals and roads for convenient access. In order to determine what was taking place with respect to water levels back from the canals and roads, another method was adopted. It would have been too expensive to send men out into the Glades on regular schedules to read water-level instruments. Accordingly, a method was developed by SCS for reading measuring devices from airplanes. A series of wells was constructed about midway between the Miami and New River canals. Each well was equipped with a float, to which a cable was attached. This was looped over a bicycle wheel suspended on a frame several feet above ground. A weight attached to the suspended end of the cable was sufficient to turn the wheel when the water level changed. Large clock-like figures were painted on a circular dial around the wheel.

At the request of SCS technicians, Navy pilots, stationed at Fort Lauderdale, read the water-level figures shown on the clocks. By crisscrossing the area, only 2 hours’ flying time was required to



**Ramie, a fiber plant now being grown commercially in the Everglades. Photo by Everglades Experiment Station.**

read the half dozen clocks. This information could not have been obtained in any other way.

To remove obstructions such as water hyacinth and moss from the canals, a "canal buggy" was developed. This ingenious machine, very different from the amphibious weasel, travels by land and water. It has four giant wheels about 8 feet in diameter and 2 feet through. They are spools, the type telephone mechanics use for transporting cable, converted into wheels. These spools operate in water and on land. Cleats are bolted on crosswise to provide traction when traction is needed; and fins are provided for purposes of navigation.

Lamar Johnson, manager for the Everglades Drainage District, designer of the canal buggy, had this to say about it: "We tried to use airplanes to spread 2-4D plant poison in canals heavily infested with hyacinth and other growth. But we usually got too much wind drift, making airplanes unusable in farming areas. With this outfit we can go through the worst infested canals and when we get through once, it is an easy matter to spread necessary chemicals from an ordinary boat."

People living in the South Glades about the tip end of the Florida peninsula have to deal with still other Glades problems, but there is one notable exception. The soil, consisting of marl of varying depth over the basal rock, is not subject to subsidence.

The principal agricultural problem in this section is to maintain a sufficient head of fresh water to hold back salt water from the sea. Along the major canals emptying into the sea, it is estimated that 60 to 75 percent control is obtained with a gate system that works to hold out sea water and hold in land water (fresh water). Control is not complete, as yet, because some of the smaller canals and ditches empty directly into salt water.

Driving through the rock-land area, the local Soil Conservation Service technician, M. H. Galatin, said, "You can't compare this lower peninsula country with anything else. The soil here is almost invisible in places, hidden away in pockets within holes in the basal rock. This rock, frequently outcropping, is rarely covered with more than a few inches of soil. . .

"This country is changing fast. Many of our farmers are staying here the year round. They used to come in and try to make a crop. Many failed and moved out. That's all changing. Acreage in truck crops around Homestead has doubled since 1945, and fruit growing is also expanding rapidly. Let's talk to some of our outstanding fruit growers."

The first grower interviewed was B. Heath Holden, manager of a grove comprising about 1,200 acres, 4 miles northwest of Homestead.

"We have about 650 acres of fruit," said Holden, "roughly about one-third avocados, one-half limes, and the rest mangoes. An inch of rain here lasts hardly a week and organic matter is rapidly exhausted in this climate. Normally, we irrigate part of our plantings, starting the middle of November and continuing through May.

"We depend very largely on supplying needed fertility. Much of the ground was almost raw rock when we started. We may have had a little nitrogen, but there was almost no potash or phosphorous. We are beginning to build up our humus supply with cover crops. Ours is a young industry, with many unanswered questions, especially with



**Water-level control plot at Everglades Experiment Station. The channel in foreground is held at 12-inch depth for high production of sugarcane variety Fla. 31-962, shown here. Photo by Everglades Experiment Station.**



respect to disease control. And we are still not sure how much irrigation pays, but we are looking carefully into this matter, with assistance from the Soil Conservation Service."

Driving north from Homestead, we stopped by a field recently prepared—by scarification—for planting. Examination showed that the rock had been broken up into a mass of fragments to a depth of about 6 inches. As meager as was the supply of organic matter, each fragment was coated with a thin covering of adhering particles of decomposed vegetable matter.

Some farmers use bulldozers to break up (scarify) the porous rock, sometimes as deep as 18 inches. It's rather expensive, but more and more of it is being done. Still other farmers scarify the rock in trenches about 2 feet wide. These trenches cross the fields at right angles and the trees are planted at the intersections of the trenches. They must be planted at just the proper depth with respect to the water table. A few inches too high or too low may cause trouble.

As we drove northward with a land-capability map on our knees, Gallatin remarked, "You can see how this map saves us a lot of explaining. Just Saturday morning, two fellows came through here looking for land for rice and cattle. I showed them this land-evaluation map, which seemed to give them the information desired. They said, 'We've been running over this State for 2 weeks and nobody ever called attention to this land map. It's just what we need.'"

"To the north of us," lower Peninsula agriculturists say, "the country has probably approached its agricultural zenith; down here in this southern tip of the Peninsula we are just getting well under way, but we are determined to make all possible progress by using our lands properly."

**FRIENDSHIP PROJECT.**—A Georgia work unit conservationist has been selected by the New York *Herald-Tribune* as a good-will emissary to India. Paul P. Patten, of Carrollton, left November 10 under auspices of the *Herald-Tribune* and OFAR for a 5-week visit in company with an Indian citizen who was brought to Carroll County, Ga., by the *Herald-Tribune* on a similar mission. Earlier this week Patten appeared on the *Herald-Tribune* Forum in New York City and talked about his work as an SCS employee in Georgia. The forum talks were presented before an audience of several thousand in New York and broadcast over two national networks.



Wallman and Taylor compare soil-moisture content of soils mulched by sawdust, and unmulched.

## SAWDUST MULCH RAISES YIELD

**A** YOUNG Sonoma, Calif., farmer, Alvin J. Wallman, uses sawdust mulch to grow more figs.

Many farmers stoke up with sawdust or use it to bed down stock, but Wallman, like more and more western farmers, has found that it can be made helpful to the land.

This 24-year-old farmer started using sawdust somewhat by chance 2 years ago. Someone sold him horse manure mixed with wood shavings. He liked the way the shavings held moisture. The next year he mulched all his fig trees with a 4-inch layer of sawdust bought in town. It worked so well that he became the top sawdust booster in the Sonoma Valley Soil Conservation District.

By mulching with sawdust last year, Wallman (a) produced 30 percent more Black Mission figs; (b) stored up enough moisture to cut irrigation to once in 30 days instead of every 10 days; (c) ended cultivating, disking, or plowing.

Mulching is easy as Wallman does it. He dumps a pile of sawdust beside a tree row. Then he floats it down the row and under trees with a cultipacker. He uses a fork to spread the sawdust close to trees. Cranshaw melons are grown between the tree rows.

Wallman has a quick and convincing way of demonstrating the value of sawdust as a water saver. First, he spades up a shovelful of bone-dry un-





Technician Taylor, Farmer Wallman and son, visit Black Mission figs mulched with sawdust.

mulched soil. It looks as though it might have come from King Tut's tomb, seemingly without a drop of water. Then, he digs up some mulched ground that hasn't been watered in several weeks. The soil crumbles in your hand, feels good and moist—even a bit dampish. Most farmers who handle the moist and dry soils decide to adopt sawdust or shavings.

The sawdust can be made still more useful by the addition of fertilizer. Sawdust saps the soil of nitrogen. Hilton Taylor of the Sonoma headquarters of SCS explains that Wallman's mulch needs fertilizer to restore nitrogen removed by sawdust. He points out that 200 pounds of ammonium sulphate per ton of sawdust is about right for Sonoma County.

Wallman has turned his farm into a sort of "mulching clinic" for testing sawdust. He thinks that the several kinds of livestock-bedding material he is trying out this year will give a good line on sawdust mulch. He likes the way mulched livestock bedding is working out so far. He also has high hopes for the mulching and crop-building values of sawdust mixed with chicken manure.

Wallman knows that deep soils would be better for fig trees. Even sawdust mulch can't put a shallow soil in the deep-soil class. But mulching, he is convinced, does both shallow and deep soils a lot of good.

**HOMES FOR WILDLIFE.**—"Woodsman, spare that den tree!" is suggested by the tag reproduced here, which the directors of the Benzie (Mich.) Soil Conservation District provide for landowners.

Because woodland and wildlife areas make up over 40 percent of the planned land use in the district, wildlife management is highly important. The district recommends that an average of two den trees per acre be left standing—hollow trees which are now or may become the homes of squirrels, raccoons, a variety of birds, and other wildlife.

The tags are used by technicians, the county agent, directors, landowners, and others to mark trees that should be left for den trees in the process of working out the complete farm plan.

The directors of the district—Donald Gray, Verne Hopkins, Ellsworth Esch, Roscoe O'Brien, and Eugene Stone—have wildlife and woodland management interests, as evidenced by their five farms, totaling 2,400 acres, of which 1,011 acres, or 42 percent of the land, are classified as woodland and wildlife.

## LEAVE THIS FOR A WILDLIFE DEN TREE

Owner .....

Cooperating with

Benzie Soil Conservation District



# NEWSPAPER RECOGNIZES TOP DISTRICTS

**T**HE farm editor and promotion manager of the *Omaha World-Herald* in November distributed another \$5,000 to soil conservation districts.

They have been doing this each year, starting in 1945.

With the 1951 round of presentation banquets, the *World-Herald* has presented \$35,000 to soil conservation districts in 7 years. Ten awards of \$500 have been made each year. One district won the award twice. That makes a total of 69 districts that have received \$500 awards.

Most of these winning districts are in Nebraska, a few in southwest Iowa.

Now something new has been added. The *World-Herald* last year opened up a new classification of awards to the previous award-winning districts.

This new phase of the program is limited to districts that have won \$500 awards. It is based entirely on the activities and accomplishments of the governing bodies of the districts. No cash is involved, but a bronze plaque is presented at a banquet held in the district. Four such awards are made, three in Nebraska, one in southwest Iowa. Members of the boards of supervisors (commissioners in Iowa) are honored guests and a spotlight is thrown on the district as an enterprising agency of local self-government.

The *World-Herald's* activity in soil conservation got underway soon after *World-Herald* publisher, Henry Doorly, read Louis Bromfield's "Pleasant Valley."

The Bromfield book set Doorly to thinking about the future of American agriculture if erosion were allowed to run unchecked, and mishandling of the land continued.

More specifically, he thought about what would happen to the great agricultural territory in which the *World-Herald* circulates.

The land, he reasoned, is the spinal cord of every business in Omaha and in the smaller cities and towns of the Midwest.

Until the past few years, especially before the soil conservation principle had been translated into

the concrete action of soil conservation districts, conservation had been regarded by a majority of farmers as a more or less academic thing. Conservation was a word you associated with Gifford Pinchot and Teddy Roosevelt or with Hugh Bennett and Nebraska's own George Condra, but didn't get very excited about.

Newspapers hadn't pitched in actively to put across this idea of conserving the soil. But Doorly thought they should. The waste of soil was something they ought to be concerned about. It seemed to him that here was a field of opportunity for newspaper service.

The *World-Herald* talked to men in the Soil Conservation Service and members of the State Soil Conservation Committees in Nebraska and Iowa.

Among them they decided that one of the ways a newspaper might best help soil conservation was to tell the story of what needed to be done, how it could be done, and tell it to all its readers, farmers and cityfolk alike.

They decided also that soil conservation might be enhanced by setting up a program of awards and recognition to people who were doing the best jobs of actually putting conservation on the land—using the land according to its capabilities and treating it according to its needs.

The newspaper's management was thoroughly sold on the soil conservation districts idea—the enlisting of farmers in their own organizations to solve their own conservation problems with technical guidance supplied by the Soil Conservation Service.

It was a logical step to build an awards program around the soil conservation districts. And it was decided that any money presented by the newspaper would go to the district as an organization to help it finance its conservation job in its own community.

The *World-Herald* never has considered its \$5,000-a-year contribution to soil conservation as a prize fund. Rather, it prefers to consider this contribution as capital for the soil conservation districts to put to work as quickly as possible in ways which it leaves completely to the discretion of the district governing body.

Virtually all of the money has been put to work for soil conservation in one way or another. Some districts have used their awards to buy equipment—terracing machinery, tree planters, grass seeders. Some have emphasized equipment that would assist

them in a better educational job. They've bought cameras and projectors for showing slides or movies. Many have supplied soil conservation booklets to schools.

For one Nebraska district, the \$500 award added the capital necessary to lease a run-down, sandy farm and set up, in conjunction with the Extension Service and the Soil Conservation Service, a demonstration farm to show improved land-use practices that could be applied profitably to similar sandy, problem land in the district.

In other districts with short treasuries (districts in Nebraska and Iowa can't levy taxes) the award money made a down payment on equipment that was put out for hire and over a period of 2 to 3 years earned enough to multiply the original investment two or three times, while building terraces, shaping and seeding waterways, and otherwise putting the brakes on soil erosion.

This is the kind of conservation progress the *World-Herald* is proud to have a part in, for it means that more people every year are doing something about putting conservation on the land. It also means that eventually conservation farming will become the rule and everyone dependent on the soil can rest assured that this basic resource is being maintained.

At the beginning of 1945, the year the *World-Herald's* soil conservation program was started, Nebraska had 52 soil conservation districts. In the next 5 years 35 more were organized and the State was completely covered with districts. Nebraska was the first State west of the Mississippi River to reach this goal.

When the *World-Herald* started its program, all of the 15 southwest Iowa counties in its circulation territory had organized districts. With this fall's award program, 13 of them will have received \$500 each.

Included among the Iowa districts that won *World-Herald* awards are the three which later won the State-wide awards presented for 3 years by the Goodyear Tire & Rubber Co. in its soil conservation program.

An Iowa conservation official, asked if he thought the *World-Herald* program had accomplished anything for conservation in southwest Iowa, pointed out that all of the Iowa Goodyear winners were districts that had been included in the *World-Herald* program, and declared:

"I wish that we had the help of such a program in some other parts of our State."

In the cash-award phase of the *World-Herald* program, the district award is based on the conservation work of individual farmers. Three farms are selected by the district boards, from nominations which anyone can make, to represent the district.

These may be owner-operated or tenant farms. The farms are judged on their land-use program, the completeness of their conservation program, and the complexity and effort involved in achieving it.

On this same basis the districts are judged against each other and the 10 best selected yearly.

At the award banquets, always held within the winning district, the individual farmers are presented recognition certificates, neatly inscribed and framed. Owners and tenants receive the certificates and their wives and families are banquet guests. Corsages are provided for the wives of honored farmers.

Districts that win the \$500 award do not compete again for the same award. This was not the case originally, and one district won the award twice. But a big splurge in district organization and the feeling that the older established districts had too much edge on the new districts prompted the paper, in conjunction with the State Soil Conservation Committees, to limit competition for the \$500 award to districts that hadn't won it.

This limitation, plus a desire to emphasize work of the conservation district governing boards, led to establishment last year of the new phase of the program limited to districts that have won the \$500 award and based entirely on district accomplishment.

Throughout the year the *World-Herald* prints many stories and pictures dealing with soil conservation. It has published several tabloid-size conservation sections. Its conservation promotion has gained many new friends far and wide.

At one of the first recognition banquets in the *World-Herald's* program, a farmer selected to be honored complained that he had done nothing to win an award.

"I haven't done anything any other farmer couldn't do," he said.

The *World-Herald*, in story and picture, has been emphasizing that point ever since.



# WATER CONSERVATION AIDS HEALTH

By CHRIS A. HANSEN



Mosquito-producing source outside of irrigated field, resulting from water runoff.



Sumps may be important mosquito sources within the field.

**B**AD irrigation may lead to bad health. We now know that certain diseases are traceable to poor handling of water in agricultural areas.

Certain mosquito-borne infections, including virus encephalitis (human and equine strains), are more prevalent in Western States than in any other part of the country. The species of mosquito, *Culex tarsalis*, the principal vector of encephalitis, as well as many other species, is found in abundance in this area. Mosquitoes breed in water other than that associated with irrigation, of course, and are found in nonirrigation areas. However, *C. tarsalis* mosquitoes are particularly adapted for breeding in irrigation water and are found in abundance in most irrigation areas in the western United States.

Note.—The author is sanitary engineer director; chief, engineering branch, Public Health Service, Atlanta 5, Ga.



Clogged drainage ditches favor mosquito production.

Other genera of mosquitoes known to abound in the irrigation agriculture areas in the West are *Anopheles*, *Aedes*, and *Psorophora*. In a section of the San Joaquin Valley, Calif., as many as 20 million eggs of a nuisance mosquito (*Aedes nigromaculis*) have been found in a single acre of irrigated pasture.

India offers perhaps the most dramatic example of how irrigation agriculture can yield at the same time both priceless benefits and tragic byproducts. In that vast country nearly 100 million people are spared the suffering of famine by food produced through the irrigation of arid land, and millions of those same people are afflicted with malaria transmitted to them by mosquitoes which, in large measure, breed in water associated with irrigation projects. Thus water that makes it possible for millions of people to escape starvation also makes possible the production of mosquitoes which carry disease to many of those same millions.

In the United States neither the benefits nor the negative byproducts of irrigation are so spectacular, of course, but the principles and the end results are similar. Irrigation agriculture is practiced on a considerable scale in the United States, principally in the States west of the Mississippi River. Some 22 million acres of arid and semiarid land have been brought into agricultural production through irrigation and made to yield bumper crops of grains, fruits, vegetables, and livestock forage. This means that irrigation is vital to our national economy and contributes to dietary balance for millions of people.



Conservation irrigation is defined by the Soil Conservation Service as "simply using irrigated soil and irrigation water so as to obtain high production without waste of either soil or water." That is something that public-health workers endorse with complete enthusiasm, for the use of water without waste reduces greatly the number of disease carriers. The more efficient the application of conservation measures to the land, the better will be the health of people living on the land. It is the commonness of corrective measures which underlines the practical soundness of the partnership of conservationists and public-health specialists in urging conservation irrigation as the remedy for evils associated with irrigation.

Public-health investigators have found that waste water is a major source of mosquito production associated with irrigation agriculture. One investigator has labeled *waste* water as 95 percent of the mosquito-production problem. Conservationists say the misuse of irrigation water threatens the continuing productivity of more than half of the acreage under irrigation in this country, and wastage of water is high on the list of water-misuse practices. Too much water improperly delivered to soil causes erosion, leaching, or waterlogging and at the same time provides pools, ponds, and backwater favorable for mosquito production.

As yet incomplete studies by Federal and State health authorities indicate that the greatest production of mosquitoes associated with irrigation agriculture occurs in downstream areas rather than in upstream areas such as reservoirs and main distribution canals. Accordingly, the brochure, "Mosquito Prevention in Irrigated Areas," emphasizes the mosquito-producing potential of surface-water collections within fields, and accumulations due to runoff from fields, and lists the following as some of the major causative practices:

- (1) Excessive use of water.
- (2) Absence of adequate drainage system.
- (3) Inadequate grading and leveling of land prior to irrigation.
- (4) Improper field lay-out.
- (5) Inadequate maintenance of ditches.
- (6) Faulty design of irrigation structures, or inadequate maintenance of such structures.

Nearly all of these factors, and often others, are associated with irrigation where mosquito production is abundant. And conservationists recognize



***Culex tarsalis* mosquitoes breed in grassy seeps adjacent to canals.**



**Waste water from irrigated fields may accumulate in roadside ditches and provide mosquito-producing habitats.**

them as describing practices which add up to damaged soil, depleted water supply, and gradual lessening of soil productivity.

Irrigation of pastures, widely practiced in some areas, is responsible for the production of a stupendous number of mosquitoes, since there is often too little thought given to preparation of land and as little to the gaging of water supply and distribution pattern. Water accumulates in lowlands and mosquitoes breed there by the millions. In one such area mosquitoes came to rest on the back of a gloved hand at the rate of 70 per minute.

In terms of both health hazard and damage to soil, excessive use of water is one of the most wide-



spread mistakes among irrigators. Water often is scarce and always a cost item which argues for its conservation. Yet, there are many areas where less than half of the water applied actually benefits growing crops, and public health investigators find swarms of mosquitoes emerging from waste water that would not be there if irrigators measured the flow of irrigation water.

Canal leakage or seepage, often due to improper construction of the distribution system, is another prime cause of mosquito production and also of damage to soil. In aggravated cases, where open ditches are used for delivery of the water, losses through leakage or seepage may reach as high as 70 percent and the average is estimated at around 35 percent. Such water gravitates to low land where it accumulates in sumps, ponds, roadside ditches, and the like, to form excellent breeding places for mosquitoes. And again, the same water that promotes mosquito production also destroys productivity of the land through erosion, alkali accumulations, leaching, or waterlogging. Rehabilitation of the irrigation distribution system through improvement of design, including provision for lining, and clearing vegetation from canals, discourages seepage and eliminates damage therefrom.

The listing of practices which subtract from the net benefits of irrigation agriculture by producing mosquitoes and damaging soil could be extended and matched with a comparable list of easily applied corrective measures. But that is hardly necessary here. Instead, those interested in pursuing the subject are referred to "Conservation Irrigation" (Agriculture Information Bulletin No. 8.) for the definition of conservation irrigation and what it means for irrigationists; and to the brochure "Mosquito Prevention in Irrigated Areas" (Communicable Disease Center, United States Public Health Service) for what conservation irrigation means in terms of public health.

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## NEW GROUND COVER

*(Continued from page 128)*

more information about getting stands of Pensacola Bahiagrass by both fall and spring seedings. We want to know whether or not farmers can depend on the grass to come up to thick stands when seeded at normal rates at the last cultivation of cotton or corn. We want to know whether it will be a safe practice to sow Pensacola Bahiagrass and

reseeding crimson clover together in late October or early November following the harvesting of peanuts.

We need additional information about the management of this sod in rotations. A few farmers already have this sod on considerable acreages of their better cropland. Most of them will want to plow these fields and cultivate the land for cotton, corn, or peanuts. They will want to plant grass and clover on other land. We want to get the information about the use of this sod in rotations by the time farmers need it.

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## PROPERTY AND LIVES

*(Continued from page 122)*

Had the 1946 costs per mile prevailed in the 1951 fiscal year, the Service would have had to expend \$26,142 additional for automobile travel and \$272,447 more for the operation of pick-up trucks.

Over the years the Service has gained an enviable reputation for conservation of human resources as well as for conservation of soil. Very early it began developing techniques aimed at preventing accidents to workers.

During those early days the Service injury rate was nearly twice as high as the all-industry rate. Now, however, it is only about half the all-industry rate—this, while industry itself cut its rate in half. Similar results have been accomplished in reducing the rate of motor-vehicle accidents. This all adds up to conservation of human resources—the lives of trained and experienced technicians.

Today, the Service is over five times as safe a place to work as it was at the outset, *and twice as safe as the average industry*. The Service is still improving its methods, determined to continue as a leader in safety. It has adapted all the applicable devices and methods worked out by professional safety engineers throughout the country. Study and analysis of accidents, safety committees, safety officers, inspections, publications, awards, training, and protective equipment have all been used effectively.

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**MORE MILK FROM FEWER COWS.**—Jake Rogers of the Anderson work group in South Carolina says: "After establishing a permanent grass program on my farm, I am getting the same milk from 28 cows that I was getting from 43 cows, with one-half the labor." Rogers is getting 100 gallons of milk per day.

# REVIEWS

**FORESTRY IN FARM MANAGEMENT.** By R. H. Westveld and the late Ralph H. Peck. Second Edition. Revised by R. H. Westveld. 340 pp. Illustrated. 1951. New York: John Wiley & Sons, Inc. \$5.

The title accurately presents the contents of the book, which recognizes and treats the woodland as an integral part of the farm. The author does not present any new forestry facts or principles but he does select those forestry practices that would best fit a farm woodland, and presents them in such form as to be more readily understood and used by the farmer. This adjustment of forestry techniques to farm woodlands can also be good reading for the professional forester who works with the smaller woodlands.

The first three chapters are aimed at getting the farmer acquainted with the woods on his farm and outlining some of the factors to be considered in its management. Including farm labor and equipment as an income factor, just as in other farm crops, is a commendable point in discussing returns from farm woodland. Definitions of forestry terms are clear and well identified with the farm forest.

In chapter 4 the author sets forth the objectives of managing farm woodlands to obtain maximum benefit from those woodlands for all time. The benefit may not necessarily be limited to production of highest quality wood products, but may also be the conservation of soil and water, and increased wildlife.

Of particular value is the attention given to the care and management of immature woodlands. The favoring of well-formed species of low value over poor-quality species of high value and the development of an uneven-age stand by selective cutting are emphasized as applying specifically to handling farm woodlands. More detailed presentation of the D+ principle of stand regulation, now proved by farmer use, would have been useful as a specific cutting and management guide.

Two chapters of rather detailed treatment cover methods of measuring wood products, along with volume measurement of the woodland and means of determining growth rate.

The chapters "Wood Products," "Marketing," "Best Use of Wood on the Farm," and "Management for Specific Products" are all clearly presented and well illustrated. These chapters have more direct application to areas east of the Great Plains.

Tree planting is well covered, but the farmer will need to check local practices before proceed-

ing. This revised edition has included descriptions of mechanical equipment now in common use. Improved techniques in Christmas-tree production, turpentine farming, and preservative treatment of wood are also well explained.

The importance of preparing a simple woodland plan that is included as part of the complete farm plan is stressed. Readers acquainted with the development of woodland planning and application of practices will likely note the author's omission of the Soil Conservation Service as an agency also providing on-the-ground assistance to farmers with woodlands.

The book reflects the author's background of experience in teaching and also his understanding of the special characteristics of farm forests, as distinct from large commercial forests. Italicizing key sentences is very effective. The lists of selected and cited references at the end of each chapter are helpful in making a more complete study of any particular subject. The appendix carries useful reference facts in convenient tables. The farmer-reader will be rewarded with a clearer understanding of what to do with his woodlands and how to do much of it himself.

C. B. MANIFOLD.

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## NOTES FROM THE DISTRICTS

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**GREENED UP THE GROUNDS.**—A lot of people had talked about the bare condition of the Trousdale County courthouse yard at Hartsville, Tenn., but nobody had done anything about it. Finally, the board of supervisors of the Trousdale County



Shovel work on courthouse grounds by supervisors of the Trousdale County Soil Conservation District.



Soil Conservation District decided to take improvement of the courthouse yard as a project to call attention to their third annual Soil Conservation District Week, October 7 to 13.

The supervisors came together one day in August, well in advance of the scheduled event. They hauled in several loads of topsoil, applied lime and fertilizer, and seeded the lawn to bluegrass, white clover, and Kentucky 31 fescue. Then they set up low posts and stretched wire around the plot. The work—and the results—created a good deal of favorable comment.



Viewing the results with pride are J. L. Bullard, district chairman; Marshall Gregory, Ray Colsor, John A. Walker, work unit conservationist; Henry Smith, vice chairman; and William Dalton, secretary-treasurer.

**SOCIETY HONORS TWO.**—In the first action of its kind in Pennsylvania, the Keystone Chapter, Soil Conservation Society of America, has cited two farmers for their conservation practices and leadership. They are Mark D. Witmer, Dalmatia, Northumberland County Soil Conservation District, and Donald T. Smith, Falls Creek, Jefferson County Soil Conservation District.

Witmer has a 285-acre farm with 88 acres in contour strip cropping, 2,600 feet of sod waterways, 30 acres of improved pastures, 69 acres of managed woodland, 8 acres of wildlife cover and shrubs, and a farm pond that gives fire protection for three sets of buildings. He is widely known for large-scale poultry operations, and also has 60 head of dairy cattle, 50 hogs, 25 acres of apples and peaches, and a large acreage of general farm crops.

Smith operates a 375-acre farm, with 150 acres under cultivation, and has established all recommended practices in his plan. He has 24 dairy cows, a herd of Hereford beef cattle, and poultry. He is chairman of his district, which has 800 members, is vice chairman of the Pennsylvania Association of Soil Conservation Districts, and is a PMA committeeman.

**FARMERS' QUARTET.**—There's music in the air around Winona, Minn., these days. Four farmers in the local soil conservation district have organized a male quartet and have set soil conservation to music, thereby proving it can be not only profitable but enjoyable.

The four farmers, Russell Wirt, 19; John Nettleton, 23; Phillip Radatz, 20; and Charles Radatz, 28, are all related, either first or second cousins. They are of sturdy Pennsylvania Dutch stock and their great-great-grandfather moved to Winona County in 1855, homesteading a farm still in the family. It is owned by E. J. Wirt, Russell's father.

All of the quartet have Guernseys. Charles Radatz was elected director of the Southeastern Guernsey Breeders' Association not long ago.

All members belong to the Church of the Brethren, and for some time they have been singing at church, at cooperative meetings, and at similar community events.

Soil conservation first came into the quartet's repertoire in connection with the retirement of John Staley, veteran district conservationist at Winona.

They sang a parody of "Old MacDonald Had a Farm" at Staley's "going-away dinner" and it was an instant hit. A few weeks later they were asked to sing it again at the annual meeting of the Minnesota Association of Soil Conservation District Supervisors.

Charles Radatz operates the home farm of 145 acres which he bought from other members of the family, while Phillip Radatz and John Nettleton operate 120-acre farms owned by their mothers.

Last of the quartet to develop a complete soil and water conservation plan was Charles Radatz, who started erosion-control practices in 1944. In 1948 he won the *Minneapolis Star and Tribune* Soil Conservation Contest for having the most complete program applied on the land.

—R. H. MUSSER.



Left to right: Charles Radatz, Russell Wirt, Phillip Radatz, John Nettleton.





Mr. and Mrs. Harmon in living room paneled from wood taken from site of farm pond.

**VARIED DIVIDENDS FROM POND.**—Some of the most valuable land on the farm of Arthur Harmon, in the Spartanburg (S. C.) Soil Conservation District, is covered with water throughout the year. Harmon has a farm pond which provides fish, fun, and profit more than enough to pay for the fertilizer required to insure a steady supply of fish.

Harmon had a 2½-acre piece of swampy, Class V-a land which was not suitable for proper drainage; at its head was a bold spring which afforded an ample supply of water in all seasons. Worthless for crops, it was an ideal spot for a pond.

The pond was completed late in 1949, and subse-

quently stocked with bream and bass. Harmon started fishing this year. He found the catches so good that he decided to open the pond to the public one afternoon each week for a \$1 fee; such permit-holder can fish until he has landed 10 bream or 3 bass.

In clearing the pond area, Harmon removed 19 different species of trees—sycamore, beech, gum, maple, wild cherry, ash, persimmon, holly, mulberry, and sugarberry. From this wood—so often considered worthless and burned on the spot, or worked up into firewood—Harmon obtained the lumber with which to panel his house.

**CATTLE GAINS.**—Hugh McGee, soil conservation district supervisor of Starr, S. C., says: "By allowing my young cattle to have access to grain in creeps, I am able to realize a gain of 600 pounds of beef per acre per year from permanent grazing crops." McGee has on his farm 21 acres of sericea and orchardgrass in combination, 33 acres of kudzu, 78 acres of fescue, and 67 acres of permanent pasture.

**BUSINESS LOOKS TO EXPERTS.**—John P. Cothran, contractor, purchased a large farm near York, S. C., and placed an order for a large quantity of seed at a seed store in York. He asked the manager to recommend the source of best help in

getting his grazing program set up. The manager referred him to the Soil Conservation Service, which is now working with him in getting his plan started.

A similar instance involved a businessman in Rock Hill, S. C., who purchased a farm and went to Cofer Tractor Co. to investigate the purchase of machinery. Cofer advised him to see the Soil Conservation Service people and get their recommendations for the farm and then come back to see him about the machinery.

John R. Williams, Rock Hill, S. C., realtor, stated that he kept up with all news items about conservation farming in York County and mailed clippings of these to prospective buyers all over the South.





FEBRUARY 1952

# Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE



# SOIL CONSERVATION •

**CHARLES F. BRANNAN**  
SECRETARY OF AGRICULTURE

**ROBERT M. SALTER**  
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE  
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## WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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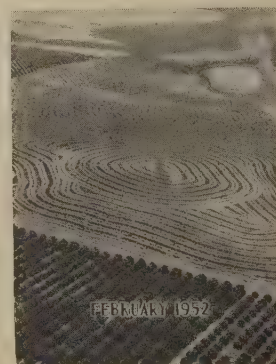
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**THE WATER BEHAVES.**—For years Andrew Delohery, a dairy farmer of New Fairfield, Conn., had been hampered by a swampy 12-acre field that separated his best fields from the farm buildings. Drainage ditches installed several years before failed to do the job required. Last spring SCS technicians, working with the Fairfield County Soil Conservation District, made a complete conservation plan for the farm.

Delohery built 3,200 feet of ditch at a cost of \$880—about 27 cents per cubic yard of excavation. Cost of leveling and fitting the land for reseeding added \$75 per acre to the expense. Of the \$1,780 total outlay, PMA approved a payment of \$360.48, making Delohery's net expense \$1,419.52.

Delohery expects the land to be worth between \$150 and \$200 per acre when seeded to Ladino clover and reed canarygrass. Due to high test, he gets \$6.40 per 100 pounds for milk. The 12 acres will bring a return of about \$1,800 in feed the first year.

A hunter wearing rubbers, a week after a rainfall of 1.5 inches, walked over the field without getting his feet wet. It used to be that hip boots would have been needed.



**FRONT COVER.**—This intriguing fingerprint design shows a planting of citrus groves on the contour. The photograph, by John Busch, was made near Clermont, Fla.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



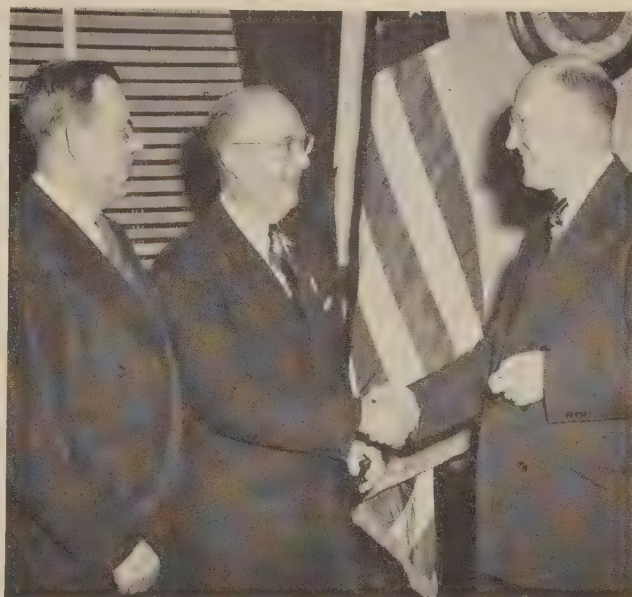
# BOB SALTER: A FRIENDLY MAN OF THE SOIL

By WELLINGTON BRINK

**A**GRICULTURAL history was made in November with the selection of Dr. Robert M. Salter as Chief of the Soil Conservation Service.

In making his choice, Secretary Brannan was acting out of regard for the unique record of the Service in its work on the land, and in appreciation of the importance of the agency's role to all future generations. In a very real sense, he was choosing conservation leadership not only for the Nation but also for the world.

After shaking many hands at Service headquarters in Washington, the new Chief lost no time embarking on a 3-week trip to the seven principal nerve centers of his organization. He was anxious



Dr. Bob Salter gets a handshake of congratulations from Secretary Brannan. The happy gentleman at the left is Waters S. Davis, Jr., president of the National Association of Soil Conservation Districts. Said Davis: "Dr. Salter has a big job ahead of him. Our Association will do everything possible to help him continue the work of his illustrious predecessor."



On November 21 an informal reception afforded Beltsville and Washington members of the SCS family an opportunity to meet and welcome Dr. and Mrs. Salter. Here they are in jovial conversation with Deputy Chief J. C. Dykes.

to talk things over with his men in the field, and to familiarize himself with developments, problems, and opportunities at ground level.

Even as I write this, Bob Salter is out meeting his team, and some of the people cooperating with his team. As soon as he can, he hopes to see and talk with innumerable other people who have the future of the American land at heart—district farmers, farmers not yet in districts, businessmen and bankers, teachers and students, civic leaders, garden-club members, partners in soil and water conservation on the staffs of State and Federal agencies, district supervisors, SCS technicians.

Every reader of SOIL CONSERVATION Magazine will wish to get acquainted with Bob Salter—hence, this short sketch by way of introduction.

Bob Salter (he likes his friends to call him that) was born at Huntington, Ind., March 31, 1892. He grew up in northwestern Ohio. Even as a youngster he had a strong affinity for soil and growing things.

Salter's love of land is exceeded only by his liking for people. Indeed, his administrative success stems in part from an exceptional gift for making





**Sara Salter is an enthusiastic partner in the development of Deep Creek Farm.**

friends. He has won many a battle before it got started, by his ready smile and instinctive forthrightness. It was in the Salter character, on becoming director of the North Carolina agricultural experiment station, to resolve a difficult situation almost overnight by getting various competing forces in the State to pull together.

His eyes are gray, expressive; his face extremely mobile. All 5 feet 8 inches, 185 pounds, are trim and vigorous. His forebears were English. Voice is low, speech rapid, smile quick and boyish, manner informal. He is given to making his points by anecdote or illustration, rather than by flat pronouncement. Even a camera catches something of his great personal warmth. His pipe is one of his trade-marks.

Bob Salter says that he and his brother both "had wheels in their heads" when they entered Ohio State University. In mechanical engineering Bob made straight A's. When their father bought another farm in 1910, however, both boys decided to be farmers. The same dean who at that time advised his star students against making the change soon thereafter adopted a little girl who was to become Bob's daughter-in-law.

The new Chief's particular and understandable pride is his family. He married the charming Sara Godfrey in 1917. There are four children, all married: Elizabeth Ann Phillips, Jr.; Robert M. Salter, Jr.; Barbara Jane Browne; and Richard G. Salter. All have made a start toward exciting,

adventurous careers. Elizabeth married an Air Force officer, and the first of Salter's ten grandchildren was born at Anchorage, Alaska, when the temperature was 50 degrees below zero.

Bob, Jr.—a six-keys winner at Ohio State University—after a turn in naval aviation during the war, already has achieved laurels in aviation research.

The tall son-in-law, E. Broadus Browne, a plant geneticist, is resident director of the University of Georgia branch experiment station at Athens.

Richard graduated from Ohio State one day, joined the Navy the following day, celebrated his eighteenth birthday the next day, and now is doing research engineering on a hush-hush project of the Naval Ordnance Laboratory.

Dr. Salter, over and over again, has been everywhere in the United States, with the single exception of Maine. He knows every country in Central America, and a fair slice of South America. Few there are as familiar with the land of the Western Hemisphere. An agronomic and soil scientist of first rank, his attention has centered largely on soil management. For many years he was chairman of the National Joint Committee on Fertilizer Application; as a result of research stimulated by this body, there has been complete redesigning of farm machinery in this field. Particularly outstanding was Salter's work with limestone.

Conscious of the fact that "everything you do to soil makes it richer or poorer," Salter in his work in Ohio developed a "productivity index" which could be applied to any farm as a means of telling how rapidly it was going downhill or getting better. This index is being widely used not only in the Buckeye State but elsewhere.

For work in agricultural chemistry, Salter was accorded a master's degree at Ohio State. Recognition also came in the form of an honorary Doctor of Science degree from Rutgers, in 1944.

Bob Salter lives an active and varied life. He plays very little golf any more—"I'm too erratic. My lowest score was about 83." Nor does he play as much bridge as formerly. He has hunted on occasion, but fishing suits him better. His particular pride and joy are gardening and landscaping, carpentry and cabinet work, in all of which he is a perfectionist.

At Wooster, Ohio, Salter's house of eleven gables, and the 5 acres surrounding, was a locally famed show place. There was a walled-in English garden





Dr. Robert M. Salter.



At his favorite retreat, Deep Creek Farm. The kitchen, glimpsed beyond the tree, modern in all particulars, is an addition to his house and a result of the Bob Salter dexterity with carpenter's tools.

with lily pond and fountain. There were fruit trees, and groves, hedges, and vast sweeps of carefully groomed lawn. The children grew up with a variety of pets—dogs, cats, a pony, even alligators. And the front yard saw many an exciting game of football and baseball. Today, the approach is by a street which the city of Wooster has designated "Salter Drive."

In 1948 the Salters acquired an historic 150-acre place on the Magothy River, in the Bay section of Maryland, about 35 miles distant from Washington. It was part of an original 1,000-acre grant to the first governor of Maryland, which bore the colorful and mysterious appellation, "Combination Defeated." Salter's "Deep Creek Farm" has 1,500 feet of frontage on salt water. "The soil is poor but beautiful to handle." As he can spare the time, Bob Salter is fixing up the house, and making a beginning with the land—which necessarily, to him, entails good management and conservation. There will be an orchard, an abundance of flowers, and lots of grass—including Kentucky 31. Some 90 acres are in woods.

Bob Salter is no newcomer to the soil conservation movement. He cooperated closely with the Soil Conservation Service at the very outset while directing soil research in Ohio. In this role he had a hand in the establishment of the first erosion experiment station in the United States, and in the first soil conservation demonstration project. During much of this time he was an official collaborator with the Service. And he has long been a strong supporter of soil conservation districts.

Dr. Salter came to the Service after 9 years as Chief of the Bureau of Plant Industry, Soils, and Agricultural Engineering, which is generally conceded to be one of the most smoothly operating units in all government.

### HIGHLIGHTS OF A CAREER

Instructor, agricultural chemistry, Ohio State University, 1914-15.

Assistant soil chemist, West Virginia Agricultural Experiment Station, 1915-16; soil chemist and assistant professor of soils, 1916-19; agronomist and professor of agronomy, 1919-21.

Professor of soils, Ohio State University, 1921-25; chief in agronomy, Ohio Agricultural Experiment Station, 1925; chairman of department of agronomy, Ohio State University, 1929-40; associate director, Ohio Agricultural Experiment Station, 1940.

Director, North Carolina Agricultural Experiment Station, 1940-41.

Chief, Division of Soil and Fertilizer Investigations, Bureau of Plant Industry, U. S. Department of Agriculture, 1941-42; Chief, Bureau of Plant Industry, Soils, and Agricultural Engineering, 1942-51.

Chief, Soil Conservation Service, 1951.

Fellow (president, 1936) American Society of Agronomy.

Fellow (vice president, chairman agricultural section, secretary) American Association for the Advancement of Science.

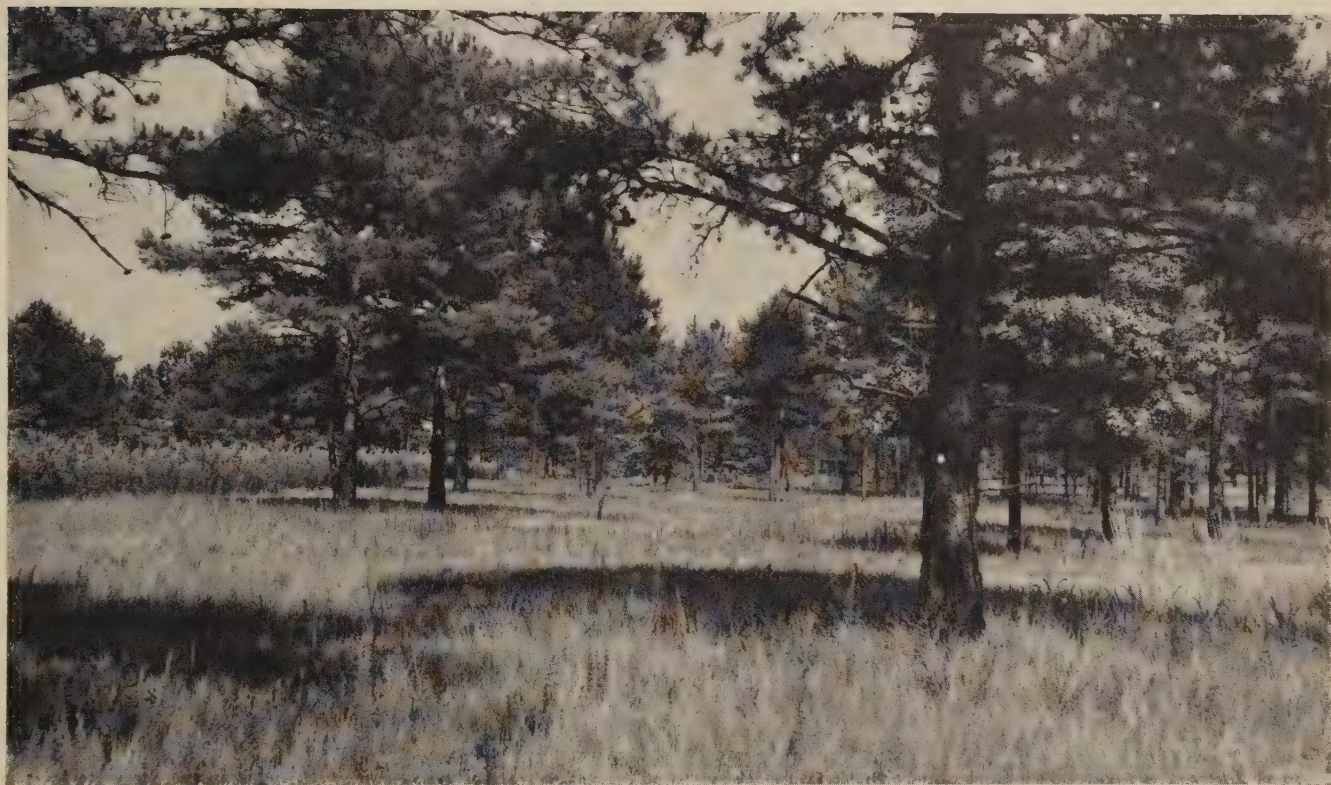
Member, National Research Council, Soil Science Society of America, and Soil Conservation Society of America.

Member, Sigma Xi, Phi Lambda Upsilon, Gamma Sigma Delta. Presbyterian.

Contributor to scientific journals, bulletins, and farm papers.



# CARE AND MAINTENANCE OF BICOLOR LESPEDEZA



Quail country. (All photographs taken by the author on the Coleman Plantation, Union Springs, Ala.)

By **WALTER ROSENE, JR.**

**F**IGURES sometimes startle you. My most recent experience with surprising figures came at a meeting of State Biologists and SCS personnel held in Spartanburg, S. C. As representatives of the Southeastern States gave their figures on bicolor plants produced annually, the totals became impressive. Everyone was astounded when the final number of 50 million was reached. Production is expected to go still higher. These plants have been made available through Pittman-Robertson programs, and over 80 percent are distributed to farmers in soil conservation districts.

People in the Southeast can well be proud of this accomplishment. No other region is progressing so rapidly in developing wildlife habitat.

Since production of bicolor nursery stock has been so successful, the establishment and maintenance

of plantings is of immediate concern. Quail like bicolor seed and most plantings are made for this game bird, but the care of the plantings is the same no matter what the intended use. Let's look at a typical planting made for the bobwhite.

Verne E. Davison, SCS regional biologist, has recommended  $\frac{1}{8}$ -acre strips. This amounts to 660 square feet and is probably somewhere near the size required for a covey of quail. Davison realized that this size was practical from the standpoint of field operations, since it would utilize 1,000 1-year-old seedlings. Therefore, if a farmer were receiving 10,000 he would have sufficient for 10 strips.

Bicolor plantings fit into most farming operations. On farms where woodland joins a cultivated field there is a sapped strip of soil on the woods' edge where agricultural crops cannot be grown profitably. These field borders will grow bicolor. Strips may also be grown successfully in open stands of woodland. All plantings must be on

Note.—The author is a biologist, United States Fish and Wildlife Service, Gadsden, Ala.



well-drained soils and must be protected from grazing.

The average planting for quail is five rows wide, with the spacing between rows 30 to 36 inches, depending on the width of cultivator used for other agricultural crops. Seedlings should be set 2½ feet apart within each row. To use 1,000 seedlings in this manner will require a strip approximately 500 feet long. Sometimes it is necessary to alter the width or length of a strip to fit the land use or the space available. Cultivation is necessary the first summer when growth begins and may be done when other crops are worked. With a good stand of plants and sufficient growth, cultivation usually is not necessary the second growing season or thereafter.

It is best to prepare a site well ahead of planting, so the soil will settle. If many strips are to be established, fall preparation is recommended. Any type of plow may be used. Fertilizer can be applied in rows as strips are prepared and should be in the soil prior to planting. Complete fertilizer is recommended at the rate of 600 to 800 pounds per acre. Nitrogen may not be necessary on some soils but is recommended generally. Phosphate and potash are essential.

Good stands have been obtained with various methods of planting. Setting the seedlings by hand is best but also the most laborious. The quickest way is to open a furrow with a turn plow, drop the plants against the vertical side of the furrow, then cover them with another furrow throwing the soil at least 4 inches higher over the seedlings than their depth in the nursery row. A tractor wheel may be run alongside the plants to firm the soil. Any method which packs the roots in well-settled soil is good. November to April is the best planting time in the Southeast.

To be considered successful the first year, a strip must be free of weeds, make at least 5 feet of growth, and produce a crop of seed. Tests on yields of year-old strips have revealed seed production up to 350 pounds per acre. In subsequent years the stems should reach a height of 6 to 8 feet and have a seed yield of 300 to 400 pounds per acre. If a strip fails to attain this height, weeds will grow beneath the bicolor stems and only a light seed crop can be expected. In this condition the planting is nearly worthless to quail, and a maintenance operation is necessary. It is essential for seeds to fall on soil free of weeds if they are to



**This bicolor planting was done with a plow March 22. A few of the stems are being covered with a hoe.**



**By June 23 many of the seedlings had made 6 feet of growth.**



**By November most of the stems were over 7 feet tall. Most of the leaves and some of the seed had dropped.**

be available to quail. Since bobwhites scratch very little, the seed must be found easily.

After the first growing season, it is usually desir-



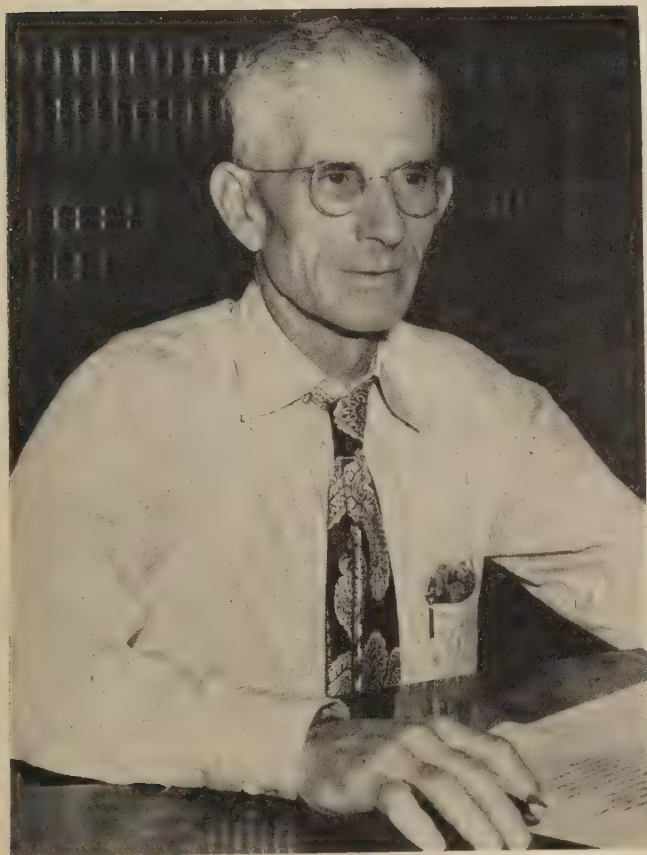
able to cut the stem back to 6 to 8 inches above the ground so it will sprout from the crown in the second growing season. This thickens the growth, makes more dense shade, and assists in weed control. In most cases the renewed top growth results in a heavy seed yield.

Periodic maintenance is essential for all bicolor plantings and should be carried out as often as necessary to keep the strip thick and producing seed. Experience indicates that on average soils maintenance treatment will be necessary about every third year. Deterioration of a planting is indicated by the following symptoms: (1) Invasion by broomsedge or other weeds, (2) short terminal growth, (3) light seeding. All of these signs are usually present when a patch is "on the way out." Cutting back, fertilizing, and disking may all be necessary to restore good growth. Fertilizing and disking probably are most important. Disking the strip destroys broomsedge crowns, and the application of fertilizer assures sufficient bicolor

growth to shade out weeds and grass. Fertilizer should be broadcast on the strip at the rate of 600 to 800 pounds per acre. Disking then works it into the soil and destroys herbaceous growth.

Maintenance practices vary according to the scale of operations and types of equipment at hand. Where a large number of strips are to be handled, and where a variety of equipment is available, the tops are first cut with a brush cutter. Then fertilizer is applied with a drill and worked in with a disk. If a brush cutter is not available, the tops may be cut with a mowing machine fitted with a sharp blade and a new set of guards. In some instances strips have been disked without cutting back. Hand clippers and brush hooks have been used also, but the latter are not very satisfactory since they split the stems down to the crown.

If you want to hear the whirr of birds as you and your dog go exploring in the fall, try some bicolor—and give it the maintenance that will keep it producing.



**Hugh D. Chamberlain.**

## **DISTRICT PROFILE**

**CHAMBERLAIN  
of  
NEW YORK**

Farmers in New York's outstanding Allegany County Soil Conservation District attribute much of the district's success to the sterling leadership of a natural conservationist, Hugh D. Chamberlain, of Caneadea. He has been a consistently good steward of the soil, as chairman of the board through 10 consecutive years—ever since the district was organized.

Allegany conservation farmers have shown their faith in Hugh's ability as a leader through reelections each year; but Hugh has just announced that he will not accept the job for another term. He thinks it is time to pass the job to other hands—time to spread the experiences he has had since January 2, 1942.

Before that, as a farmer and miller, Hugh Chamberlain plugged for soil and water conservation and good land use as a private citizen, who was among the earliest in Allegany to sense the erosion danger. Then, he became a charter member of the

County Land Use Planning Committee and later was one of the chief proponents in establishing the district.

Since then, well-deserved recognition has brought him to the chairmanship of New York's State Soil Conservation District Association, and participation in the National Association of Soil Conservation Districts, in which he has represented his State and district as a delegate.

Allegany is unique in that ever since the district started, board members who are not representatives of the county board of supervisors have automatically voted themselves out of office at the end of each 3-year term. This regular turn-over acquaints more farmers with the problems of the district, develops new leaders and scatters them over the county, and makes a stronger organization.

Two board members who represent the county board of supervisors remain in office until replaced by that body. This policy shows another instance of Chamberlain's leadership: He has been a member of the county board for more than 10 years. In Allegany the voting public has kept Hugh Chamberlain on the job! Now, he also is retiring from the county board. "Time to pass responsibilities in that job around, too," he says.

Chamberlain owns two river-bottom farms, one including hillside land. Both are covered by complete conservation plans in which establishment of improved pastures, woodland improvement and protection, and reforestation are featured.

Success of Chamberlain's stewardship is written in terms of district accomplishments: nearly 1,300 cooperating farmers with more than 170,000 acres under complete conservation plans, 9,500 acres of contour strips, 7,500 acres of pasture improvement, and 17,000 acres of crop rotations. It is spelled out in 220 miles of diversions, 1,100 acres of farm drainage, 50 miles of outlets and farm water-courses, 33 miles of stream-channel improvements, 9,200 acres of reforestation, and 27,000 acres of woodland protection and improvement.

From another angle, success under the Chamberlain leadership is found in the district's ownership and operation of 35 pieces of equipment ranging from two 6-D crawler-type tractors, a 20-ton truck and trailer, and four TD-14A's with blade, to a wood chipper, stump puller, and concrete mixer. In a modern machine shop and storage-supply building, leased and operated by the district, all the equipment is serviced by district mechanics.

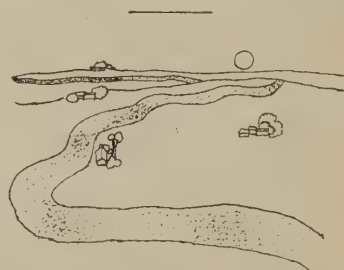
In addition, in a single year, the district has operated as many as a dozen other pieces of equipment obtained on loans from the Soil Conservation Service, the Allegany County Reforestation Committee, and other organizations. And, too, the district has employed the services of as many as 35 contractors, who have operated about 100 more pieces of equipment—nearly 150 pieces of equipment working for Allegany cooperators in a single year.

In spring-summer-fall working seasons, when operations are continuously at top speed, the district has as many as 15 full-time employees on its pay roll, for work with the 10 SCS technicians and aids. When tree-planting time comes each April, the district pay roll covers as many as 150 workers.

All this activity is part of the \$80,000 business done by the district in 1949, and the \$110,000 volume developed in 1950. It is emphasized in the current \$20,000 bank balance beyond all indebtedness, and is reflected in such single accomplishments as building more than one farm pond every day through a full month.

Hugh Chamberlain does a lot of field work for the district and spends at least 1 day a month at the district office in the courthouse. When district demands are heavy and his time is short, he finds a way to *make* more time available, just as he did in World War II years when he sold his mill so he would have more time to devote to the district.

—HUGH F. EAMES



**300-MILE STRIP.**—Complete reseeding equal to 20 farms of 120 acres each has been finished in New York State by the Tennessee Gas Line Corp. In laying a 24-inch line from the Pennsylvania border to Buffalo, then east to Albany, a strip 300 miles long and 4 rods wide has been smoothed and reseeded. Where slopes are steep, hay and straw have been applied as mulch to hold the topsoil in place until new grass gets started. The job involved planting 384,000 square rods, or 2,400 acres.



# NOT ALL THE UPLANDS WERE DAMAGED

By A. E. McCLYMONDS



Incomplete conservation doesn't do the job. This land had been contour stripped but lacked terraces. Erosion ensued, as can be seen. Badly damaged itself, this field contributed to the silt load that created so much havoc in the floods. It is about 3 miles east of Gypsum, Kans., drains to the Smoky Hill River, which joins with the Solomon, Saline, and Republican Rivers to create the Kaw.

**E**ROSION is credited with having levied a \$200,000,000 toll in damage on the upland farms and ranches in the Kansas flood area in 1951, and contributed much to the silt load in the main streams and tributaries.

Very little damage to the upland occurred, however, on farms and ranches where complete conservation plans had been applied and properly maintained. Nor did so-treated farms and ranches contribute appreciable amounts of silt to the floodwaters.

This became apparent as reports came in to the Soil Conservation Service and as employees had an opportunity to interview farmers to learn what happened.

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Note.—The author is regional director, Soil Conservation Service, Lincoln, Nebr.

In each case, the experience was substantially the same.

Water that could not be held on the land was forced to go the way the farmer wanted it to go, by way of terrace channels and grassed waterways.

There was some silting in terrace channels where row crops were grown.

Some terrace breaks occurred, but the reports indicate that in no instance was the water able to break through a series of terraces on its way downhill; always, it was stopped and sent through terrace channels to the waterways.

During the storms, most farmers kept an eye on what was happening. As soon as they could, they got out for a close look. The color of the water in

(Continued on page 158)



# Nine Farmers MOVE Forward

## THROUGH UNITY OF PLAN AND SPIRIT

By BARRINGTON KING

**F**ROM tenants to landowners in an active neighbor-group program of soil conservation is the record of nine Negro farm families of Iredell County, N. C., in the Middle Yadkin Soil Conservation District.

Until a few years ago, most of the nine farmers were tenants on farms in the nearby neighbor group of which Roy Weber is the dynamic leader. They had seen the effective work this group had done by working together and when they bought farms of their own—most of them through the Farmers Home Administration—they asked the help of the Soil Conservation Service in developing a group plan.

Some of the group have been landowners for several years, like Conway Bailey, the group leader, who bought his 37-acre farm 9 years ago, and Sullivan Miller, who has owned his 74-acre farm since 1928. Others, like David Mayberry, a former tenant who bought his 99-acre farm a year ago through the FHA, are newcomers. But working together on common problems has welded the group together as an effective unit.

Other members of the group are Burgess Bailey, Curlee Bailey, Robert Bailey, J. L. Jones, Will Brown, J. E. Adams, Calvin Turner, John Henry Miller, and Walter Adams. With their wives and children, the group includes 79 persons in all.

(Continued on page 158)

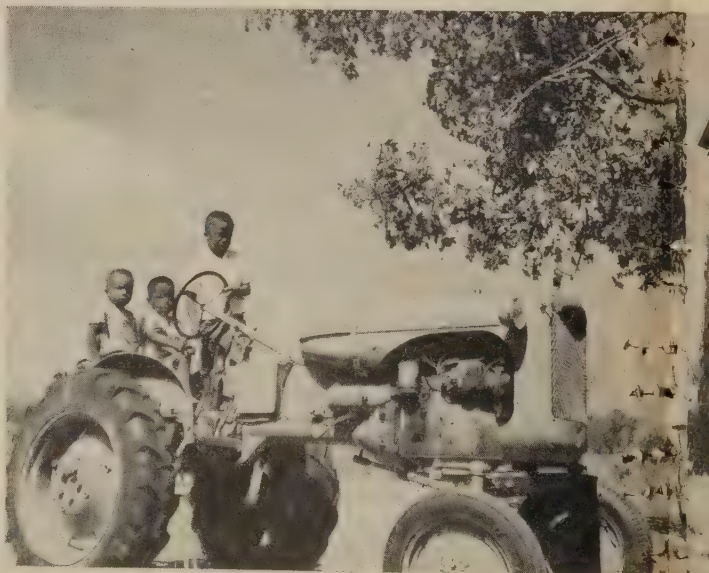
Note.—The author is chief, regional division of information, Soil Conservation Service, Spartanburg, S. C.



Strip cropping of corn, alfalfa, small grain, lespedeza, and clover of Burgess Bailey



Standing in field of alfalfa are Q. W. Patterson, farm planner; Sullivan Miller, whose conservation program is under discussion; and D. O. Ivey, county agent



Modern machinery appeals to young folks of all ages. The three sons of Calvin Turner are seen here on his tractor.





red clover, with tobacco in background at right, on farm  
s Bailey.



Some of the nine families in the neighbor group.  
Conway Bailey is at the extreme right in front row.



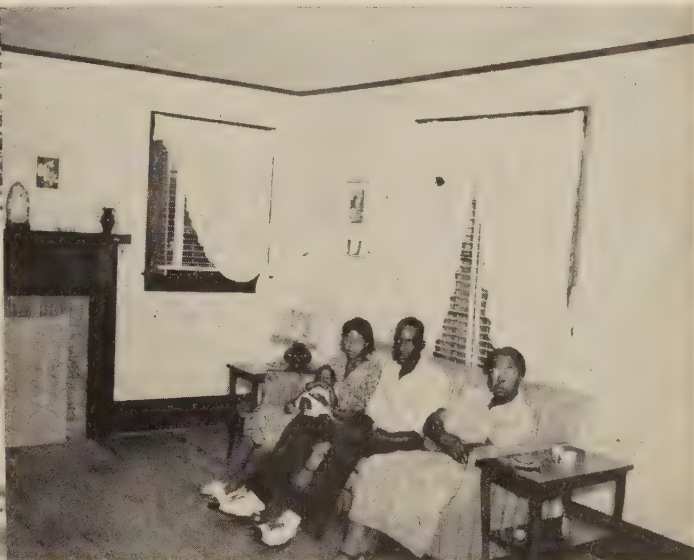
John E. Adams and sons, Thomas and Charles, examine  
a load of tobacco harvested on his farm.



Cotton shares the spotlight with hay on the farm of  
Robert Bailey.



With more than 700 bales of lespedeza hay to supple-  
ment green winter pastures, Conway Bailey is secure  
against whatever weather comes along.



Conway Bailey, his wife, baby, and mother, in living  
room of his home.



## NINE FARMERS

(Continued from page 156)

Each member of the group has a copy of the joint district plan, which includes 14 farms, with a land-capability and land-use map for the entire 841 acres. Conway Bailey says that having their conservation activities brought together on a single map has in itself "increased the group interest a hundred percent."

"Working together in conservation has made them all stand up and take notice," Bailey declares.

Others have stood up and taken notice, too. This business of neighbors working together is a stimulating experience that has in it something of the missionary spirit, and their white friends in the Weber group have lent active assistance and encouragement to their former tenants in their group activities.

In carrying out their conservation programs, the group also has the active assistance of D. O. Ivey, Negro county agent, who works closely with the group and with C. C. Julian and Q. W. Patterson, SCS technicians in the Iredell work unit.

## UPLAND DAMAGE

(Continued from page 155)

the waterways ranged from "clear enough to drink" to slightly roily.

Let's see what occurred on the farms of Roy Gfeller and Pete Ritter, whose farms are in the Republican River watershed. Both are in the Geary County Soil Conservation District. Gfeller is a member of the board of supervisors. Both have had complete soil conservation plans on their land for some time, Gfeller for 10 years and Ritter for 6.

"I've been over the whole farm and can't see any sign of damage," Gfeller said. "Did I watch the water in my waterway? You bet I did. It ran a foot or more deep and looked clear enough to drink."

He explained that while his land is terraced, it is also farmed in contour strips so that every other terrace is in a grass-alfalfa mixture. The structure of the soil has been improved greatly through the use of grass and alfalfa in the crop rotation.

"We had a foot of rainfall in 4 nights," Gfeller said, "and kept it under control. As for the wet season . . . I'll take it any time in preference to dry years. Besides protecting the land, conservation has improved production a good deal."

Ritter, on the other hand, had some sorgo that had been planted late and had made little growth.

"Oh," he conceded, "there was a little overtopping of a couple of terraces, but they weren't damaged. Naturally, some silt was washed down to the terrace channels and will have to be plowed out."

But as to damage. He doesn't figure that he suffered any worth mentioning. The wheatfields were still smooth, so he was able to harvest the wheat while it was still good.

One waterway, which gets water from a farm above, in addition to water from his own terraces, suffered some cutting but nothing serious.

"Does conservation pay? Well, I got my wheat, didn't I?" Ritter grinned. "But seriously, protecting the land like this and keeping the good soil at home has paid well."

Further east, in the Osage watershed, L. B. Frogette, Jerry Hobbs, Dwight Williams, and Ernest Tawney, in the Franklin County Soil Conservation District, told their experiences. The first three live a mile north of Princeton, Kans., where two highways cross, and Tawney is about a mile west of town.

"If there was any damage, I couldn't see it," Frogette remarked. "None of my terraces was overtopped. The only place where I figure I could have had trouble was where the water had swept newly cut hay to a terrace channel."

A lot of water ran through the spillway of the pond, but did no cutting.

"I have some land that was damaged, though," he said. "It is some that I rent, which has not been terraced. It was cut up pretty badly. It shows what my land would have looked like if it hadn't been protected by conservation. But instead, my fields are smooth."

Hobbs, whose father started the conservation plan in 1936 in cooperation with the CCC camp, before the district was organized, has continued to make improvements in the conservation system since he took over the farm.

"I guess I lost a little soil, because the water that ran off the fields was a little discolored," Hobbs said. "But I'd hardly say I suffered land damage except at one place. One bottom terrace broke, but the break was too low on the slope for the water to do much harm. There was a ribbon of silt less than a foot wide and as long as the break was wide in the grass at the foot of the field. There was also a little cutting in one waterway."



He has a large dam that was full when the big rains came. The spillway handled a lot of water, he said. Now, he wishes he had had a drop inlet through the dam so that the water level would have been low.

"I'd like to have seen how it worked," he said. "It's my opinion that I would have controlled the flow of runoff from this place."

Hobbs had only to go across the road for confirmation. Williams' pond has such a drop inlet through the dam, and no water flowed through the spillway. The drainage to the pond is mostly grassland.

"And yet," he recalled, "it rained so hard that the water from another drainage on the farm ran a foot or more deep across the highway, although it was almost clear."

Williams had been ill and could not get over the farm soon after the storm. The color of the water that crossed the highway, and which came mostly from row crops, convinced him that little damage was being accomplished. The drainage and waterways are principally in brome grass.

"Brome grass is wonderful stuff," according to Williams. "Look how it took the flow of water from this land and down the waterways, and it isn't hurt at all."

Tawney operates three rented places. He wasn't able to get to two of the farms during the big storm, he said, but he was out in the rain on the place where he lives. He started his conservation plan 7 years ago. But before that, he had experience on his dad's farm where "conservation has improved production so that he gets a nice living from a place considered pretty small for a family."

"Water flowing in the waterway at this place was slightly roily," Tawney explained. "But that was to be expected. You're bound to have some soil move when the ground is saturated and a heavy storm like that comes along."

"But no terraces were overtopped by the water. There was some silt in the channels. Not much more than I expect normally."

Roy Deay, about 7 miles south of Lawrence, and Perry McPheeters, 2 miles north of Baldwin, in the Douglas County (Kans.) Soil Conservation District, have farms which drain to the Kansas River.

Deay, who built all but two of his terraces with a moldboard plow, reports that water falling on his farm had to go the way he wanted—out through

the grassed waterways. There was no overtopping of terraces.

"Water that came off the land protected by alfalfa or grass was clear," Deay explained, "but that which came off the row crops was slightly discolored. A little silt in the terrace channels is the only evidence of soil moving. The fields are smooth. There is no evidence of cutting."

McPheeters has some bottom land and also some pretty steep land in his place. The bottom land was just plain wet, and you couldn't do anything about that. But, he said, conservation really saved the day on the upland.

"The terraces held—no breaks at all," he recounted. "The water kept flowing surprisingly slow through the terrace channels to the waterways, and it was clear. If the water had been carrying any

(Continued on next page)

## MAN WITH A MESSAGE

A timely and quotable quote from Leon J. (T-Bone) McDonald is this: "We have come to recognize soil conservation as a weapon of war and a peacetime necessity. Man and the land must be prepared."

"T-Bone" is a colorful westerner, with a Billy Sunday flair for speaking, who has been much in demand for platform services in as widely separated parts as Florida and North Dakota. He began work with the Soil Conservation Service almost at the outset, way back in 1935, and today is assistant State conservationist for Oklahoma. His talks are replete with anecdote and illustration. One of his favorites is about the white man, heap crazy, and the Injun, smart and lazy:

"White man make big tepee. Plow hill. Water wash, wind blow soil. Grass gone, land gone. Whole place gone to hell."

"Indian smart. No plow land. Keep grass. Buffalo eat. Indian eat buffalo. . ."

McDonald talks with his whole body, and captivates his audiences. Soil erosion is a very personal enemy. Edward J. Meeman, editor of the *Memphis (Tenn.) Press-Scimitar*, calls him "an educator, evangelist and entertainer all in one delightful package."

appreciable silt, there'd be some evidence in the grass, but I can't find any."

McPheeters started on his conservation plan 5 years ago. Terraces and contour farming are necessary but by no means the whole answer, he holds. He practices a crop rotation so that no land is in crops more than 2 years in succession. The rest of the time it is in grass or alfalfa or a grass-alfalfa mixture.

"The structure of the soil is a whole lot better than formerly," he said. "This makes it possible for the soil to take in more water and hold together better. Water can't move it so easily. I consider this rotation just as important as any other part of the conservation program.

"Can a farmer really afford it? On my place, at least, production has increased materially since I put this conservation plan on the land. I have bigger yields while the land is in cultivated crops, so I don't have to cultivate so many acres. And I have more land producing grass for pasture, hay, and seed."

Just how much water these farms had to handle is indicated by the fact that the season was too wet for alfalfa in the Osage and Kansas River drainages, both on farms with and without conservation plans. The farmers there got a good first cutting of hay, then the alfalfa began to die—flooded out.

All these farmers had developed complete conservation plans with the aid of the Soil Conservation Service. Their land is used within its capabilities. The right combination of conservation practices is used according to the needs of the land. Not only were these conservation plans fully applied, but they were properly maintained.

The examples cited here do not imply that there was not extensive damage to upland farms where some conservation practices had been established. There are many hundreds of miles of terraces where breaks must be repaired and terrace channels cleared. Some terraces were not backed up by other conservation practices; others could have held except for lack of proper maintenance of the terraces or other conservation measures. But everywhere the worst erosion damage was to unprotected land.

The lesson to be gained is that damage on upland farms would have been reduced to insignificance if complete conservation had been applied to all of them. Damage on bottom lands likewise would have been reduced. The upland would have kept its productive top layer of soil at home.

# MAPPING FROM THE AIR

By O. E. McCONNELL

**S**HORTLY after noon one day last summer a small airplane flew over the Gilmore McLeod ranch near Brownlee, Nebr. It was piloted by the rancher's son, Gordon, but this time he wasn't using the plane as a substitute for range riding to look after livestock.

He had a passenger—Don Sylvester of Valentine, Nebr., work unit conservationist with the Cherry County Soil Conservation District. Sylvester was mapping the features of the ranch on an air photo: the range sites, dry valleys, wet valleys, old fields abandoned for cultivation, fence lines, windmills, and so on.

They were making the preliminary survey that is necessary in developing a soil and water conservation plan for the ranch. It is one of a number of cases where Sylvester has been taken up in a rancher's plane for this purpose, with substantial savings in time.

"It took us just 1 day to complete development of the conservation plan for the 9,000-acre ranch," said the young technician. "My experience is that it takes three full days to do the same thing entirely on the ground."

But there is more than timesaving to be gained. From the air, one gets a clear view of many things that cannot be observed properly from the ground.

Distance is a big problem in ranching areas. Roads are often little more than winding trails, making travel slow. Reduction of the amount of time spent in traveling—to and from a ranch and also over a ranch—is a matter of prime concern.

Cherry County contains over 6,000 square miles—as much as Connecticut and Rhode Island combined—and 90 percent of the area is sand hills, through which there are only two highways. All other roads are winding trails through the sand hills.

It is 50 miles from Valentine to Brownlee, from which it is necessary to drive another twenty-odd miles westward to the McLeod ranch. It takes a

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Note.—The author is regional chief of operations, Soil Conservation Service, Lincoln, Nebr.



good 2 hours to get there. Then, working on the ground, much time would have been spent over the ranch to determine acreages of different kinds of range and to spot fences, watering places, ranch roads, and other features pertinent to range management.

"Gordon McLeod suggested that the ranch could best be seen from the air," Sylvester says, "so up we went. We were up only about 45 minutes, but did a better job than if we had spent many hours on the ground. Furthermore, we knew where to go to get the information that must be obtained on the ground."

Following the plane trip, McLeod and his two sons checked range conditions and discussed range-conservation measures and grass seedings for the formerly cultivated, but now abandoned, fields.

In the evening, the McLeods and Sylvester, aided by the information that had been recorded on the air photo, developed the plan of conservation operations for the ranch.

The job was completed in a single day.

While the use of small planes has shown up to advantage in speeding up soil and water conservation plans in this ranching area, Sylvester said, not all of the job can be done from the air.

"One can tell the degree of utilization of the current season's growth of grass from the air, and also the different kinds of range sites," he explains, "but you cannot determine range conditions from a plane. That must be done on the ground. Outlining the range sites from the air saves a lot of time, since the only job on the ground is to determine current range conditions. The range site (that is, the kind of range land) determines potential range cover and productivity.

"Need for many of the conservation measures can be determined from the air. Among them are areas where mowing is needed, where watering places should be developed and salt provided in order to get grazing properly distributed. It is easy to discern the pastures or parts of pastures

that need adjustments in stocking rates, the boundaries of blow-out areas, and where cover is so thin that blow-outs threaten."

Another experience cited by Sylvester deals with the use of an airplane for determining the boundaries of a drainage and other physical features before designing a large water-spreading project. This was on the Arnold Fink ranch, 70 miles south-

east of Valentine. Fink flew to Valentine to pick Sylvester up, and returned him to headquarters the same day.

"It would have taken at least 3 days to make this preliminary survey from the ground, and it still wouldn't have been so good," he says. "Part of the drainage area was rather swampy, and we would have had to walk. We could have seen little under those circumstances.

"As it turned out, the drainage was easily defined from the air, and the nature of the landscape observed. We hope to eliminate swampishness of a part of the drainage through control of the runoff, as well as improve grass production of the whole area."

Fink is the only rancher thus far who has flown to Valentine to get him, but others will come any time he suggests it. Most of the time he feels that it is better to drive to the ranch, for the reason that most small planes have insufficient space for the equipment that usually must go along.

The light plane can also be used advantageously in checking the progress and effectiveness of soil and water conservation measures. Sylvester learned this when Loren Boyer, whose ranch is 54 miles southwest of Valentine, took him up. From the air, he could note the progress of the new tree plantings, the effectiveness of the blow-out control measures, and the utilization of the range. The progress in healing blow-outs is revealed by comparing the new view with the former air photo.

Although the use of the airplane speeds up the gathering of information and gives one a better chance to size up the conservation job, Sylvester



**Donald Sylvester and Arnold Fink ready to take off on a preliminary survey of Fink's ranch 70 miles southeast of Valentine, Nebr.**

adds, it is not quite so easy to make notes and outline features on the air photo. On the ground, one can stop the car while he does these things, but not in a plane. It keeps moving, and the mapping must be done rapidly.

"As you can see," he says, "there are some small disadvantages to using the plane. But compared with the advantages, they are insignificant. And

the saving in time makes it possible for me to serve more of the district cooperators. Since the district supervisors always have a backlog of applications for technical aid, this saving of time is vital."

Not the least of the advantages, Sylvester concludes, is the greater comfort of plane travel compared with bounding around on rough ground in a jeep.

## LEROY FAUST AND HIS HORIZONTAL WELL

By LAWRENCE D. HAAG

WITH water and its management demanding more and more consideration on Pennsylvania farms, the experience of LeRoy Faust, R.D. 1, Weatherly, Carbon County, demonstrates the extent to which some farmers will go to get a supply.

Faust's experience is unusual because his well is horizontally drilled. It's a center of interest for visitors at the 256-acre farm, 5 miles south of Hazleton, where he lives with his 75-year-old father, his wife, and two daughters. He works part time in coal mines.

LeRoy has been interested in soil and water conservation for many years. In 1940 Ted Hebel, SCS technician, helped him make a complete conservation farm plan and lay out his fields for contour strip cropping. It was one of the first eight pilot demonstrations established under the joint program of the Soil Conservation Service and the old Agricultural Adjustment Agency, now known as Production and Marketing Administration.

Because LeRoy is convinced that soil and water conservation is vital to the welfare of any community, he helped neighbors organize the Carbon County Soil Conservation District in February 1947. He has been a leader in the district ever since, is its director and secretary-treasurer, and has his own complete conservation plan in effect.

The farm's water supply originally came from a natural spring in the lowlands below the buildings. Because it often failed in dry weather, a

vertical-type well was drilled near the house, water being located at 70 feet. But the water there is very hard and not to the liking of the Fausts. Besides, it had to be pumped and that required maintenance and electricity costs to keep it running.

From their mining experience, LeRoy and his father knew that water often can be a problem rather than an asset. Many times they had worked with feet and clothes wet from water dripping or seeping from the walls or oozing from the floors of the mines. So they decided to prospect for a new supply in the wooded mountain back of their house and barn.

They started digging a hole a little wider and not quite so high as a standard house door back into the hill, just the way miners do when they open a small coal mine. At first the going through the soft earth under the forest trees was easy, but the "roof" had to be supported on heavy planks and timbers resting on top of big posts. Earth and stones had to be moved out and carted away.

They hadn't gone more than 50 feet into the hill before they struck solid rock—but no water. This would have completely halted the most of us, but not the Fausts, who knew how to make tough, hard coal "rock" yield. They applied mining techniques and little by little worked their way back farther into the mountain.

For 2 years they kept hammering away every spare hour they could find, while keeping the farm work and mine jobs going. When they had a tunnel-like hole about 175 feet in the hill, mostly through

Note.—The author is district conservationist, Soil Conservation Service, Allentown, Pa.





LeRoy Faust at entrance of tunnel.

solid rock, there still was no water. Disposal of rock was becoming more of a problem. Each rock had to be carried farther and farther to the outside opening.

The Fausts didn't know the meaning of "quit," but they did realize that they would have to alter tactics. With the feeling that the water vein might lie only a few feet farther back in the rocks, they decided to see if a well driller might help. Ordinary drillers have little trouble sinking a vertical well from the surface of the earth, but what the Fausts wanted was a "horizontal" well so that water would run to the house and barn by gravity. They never seemed to think about "if" they would strike water; it was always "when."

When they found a driller who was willing to try, they helped him rig up 175 feet of 4-inch pipe through which he aimed his diamond-headed drill and started to bore a 3-inch hole back through the solid rock. He went 100 feet, still without success. "Keep going," said LeRoy.

Finally at 104 feet beyond the end of the 175-foot tunnel—279 feet inside the mountain—the drilled hole became wet. The elusive water the Fausts had been seeking began to seep into the hole. It was clear and soft, with no trace of acid. The flow, while not great, was enough, LeRoy

thought, to satisfy the normal needs of his family and his livestock.

There was still more hard work to be done before the Fausts could get the water where they wanted it. Near the inside end of the tunnel and about 15 feet from where the water trickled out of the breast-high drill hole, they built a concrete retaining wall. Heavy wooden planks were lugged in and cut to make a form to hold concrete mixed by hand and brought in to make a wall. With water in sight and no more rocks to cut away, the rest was easy. Iron pipes were cast in the bottom of the retaining wall, which serves as a dam to impound over 2,000 gallons of water. Other pipes were connected to lead the water to the house and other buildings.

You can get a drink of this horizontal-well water at LeRoy's home now, but it tastes best if you take a flashlight, as I did with him one hot July evening, and walk back into the tunnel. There an aluminum cup rests on the top of the retaining wall for you to dip some of the clearest, coolest, most refreshing water you ever tasted.

LeRoy has 40 acres of contour strips, 800 feet of open field drains, and 400 feet of diversion terrace. He has 2 cows, 4 steers, 2 hogs, and 150 hens, and grows 4 acres of potatoes, 1½ acres of truck crops, and grain to feed his livestock.

From lumber cut in his wood lot, LeRoy and his dad have built four service buildings. They have made their own concrete blocks and built a garage, farm shop, and potato-storage cellar that they wired for electricity. For servicing their car, truck, and tractor tires, they have installed their own air compressor.

The Fausts know and appreciate the value of good, pure water. They worked hard to get it. They continue to work hard through the Carbon County Soil Conservation District to protect and conserve soil and water—both precious natural resources.

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**CANNY BUYER.**—W. A. Dolan, of Augusta, Ga., had a 2,200-acre farm for sale in Aiken County, S. C., and McKendree Barr, of Leesville, S. C., was a prospective purchaser. Dolan had been doing a good job of soil and water conservation in cooperation with the Edisto Soil Conservation District. Appraisers of the Federal Land Bank at Columbia used the land-capability information in making their appraisal. The upshot was that Barr bought the farm—sale price, \$83,500.





Dedekam purebred Holsteins on irrigated pasture.

## MORE MILK FROM IRRIGATED PASTURE

**G**EORGE DEDEKAM, of Santa Rosa, Calif., owns a herd of cows which averaged 446 pounds of butterfat last year. He is one of many young western newcomers to dairying who is making soil and water conservation pay.

At 29, Dedekam has picked up a lot of dairying knowledge since he began helping his father C. F. Dedekam, a retired San Francisco insurance broker, turn a 385-acre dry-land hay farm into a Grade A dairy enterprise.

Folks still remember how the elder Dedekam put in one of the first flood-border irrigation systems in the Central Sonoma Soil Conservation District soon after taking over the farm. Three of his neighbors have that type of system now.

Dedekam gave up an office job in San Francisco to work with his father. Already his father had taken a long step in good land use. He had started fattening feeder calves on dry-land pasture. When the feeders didn't put on weight quickly enough, SCS technicians helped him level and lay out 20 acres of improved pasture. They also selected the right mixture for the pasture—Ladino clover, trefoil, alfalfa, tall fescue, alfalfa and Dallisgrass—and gave him suggestions on fertilizing.

The two turbine-pumped wells dug by the elder Dedekam yielded enough water to flood-irrigate 10

acres and sprinkle 2 acres a day. His calves made good gains in weight. But beef's fluctuating prices gave many anxious moments. Dairying looked much safer and peaceful over the long pull.

George Dedekam became a farmer about the time his father changed from beef to butterfat production two summers ago. Dairying called for more shifts in operations. It was necessary to build a Grade A milking barn. Then the Dedekams bought 40 first-calf heifers—the beginning of a 104-head milking string.

Father and son worked together to put more conservation on the land. Fifty additional acres went in irrigated pasture. When one main ditch, supplying water to a sloping 20-acre field, began to wash badly, they showed themselves to be good conservationists by switching from flood irrigation to sprinkler irrigation.

The 70 acres of irrigated pasture is divided into nine fields. Each field is grazed about 3 days on a rotation schedule of approximately every 27 days. A crop of 80 tons of hay was cut from the pasture this season.

Dallisgrass was added to the second 50-acre seeding. George Dedekam says that cows prefer Dallisgrass to Alta fescue. He would like to have more Ladino clover in the pasture.

Young Dedekam isn't greatly concerned about the 30 inches of rain that falls from November to March in the Santa Rosa country. Water goes on as soon as cows are off a field. He sprinkle-irrigates 20 acres, putting on about 31,000 gallons per acre every 10 days. He uses flood borders to irrigate the rest of his improved pasture. He irrigates every



15 days using more than one-third more water per irrigation than with sprinklers.

So far, SCS technicians have helped stake out and level 70 acres for flood irrigation. Less water is used and better coverage is obtained by spacing the 300-foot-long check dikes 18 feet apart. Soils are fertile and deep, and of a heavy loam type.

Today George Dedekam is approaching his goal of being a good pasture manager and grazier. He doesn't believe in skimping on forage. There is enough good forage on the 40 acres his herd uses to feed 50 cows. He credits the good fat marks his herd is making largely to soil and water conservation.

Here are some of the pasture practices that the Dedekams find helpful. Irrigated pastures are well fertilized. Only about 2 to 3 acres can be fertilized a week now. They hope to fertilize most irrigated pasture before summer's end. They use droppings and not litter. They figure the 7 cubic yards per acre put on amounts to well over 100 pounds of nitrogen and phosphate acid per acre. They say their cows like fertilized better than nonfertilized pasture.

Every fall and spring George has been applying 300 pounds of superphosphate (60 pounds of phosphate acid) per acre. He reasons that by using chicken manure he can get along with one phosphate application a year.

He also applies liquid manure through irrigation. The manure washed out of his barn goes on hay land.

Cows are on the irrigated pasture about 8 months in the year. From Christmas to March 1 they are fed about 25 tons of purchased hay a month. Last year he turned his hay crop into 400 tons of silage. He will feed more of his own hay from now on.

George Dedekam's pasture is older and better established now. He expects his cows to beat last

year's production average of 446 pounds. April DHIA records showed that several cows in his herd produced more than 100 pounds of butterfat. One Holstein had an April 1951 output of 104 pounds. Ten cows gave more than 80 pounds that month.

## FOUR YEARS OF STEADY PROGRESS

By MARION F. EUBANK

**F**OUR years ago I inherited 11 acres of land. I bought 29 acres more, including a small house, one tobacco barn, and one not-too-good combination tobacco-livestock barn.

My wife and I, taking inventory, found that we owned 40 acres of land and buildings, plus 10 milk cows on 40 acres of rented pasture, plus one horse, plus part interest in a small tractor, a car, and a few small implements. A hurried look around showed that everything except the tobacco barn needed repairs; yes, even the horse.

The dwelling had electricity, but no water. Inasmuch as we were in a limestone region of small underground caves, we couldn't expect to get a successful well, and our 40 acres had no permanent source of water. Even the 5,000-gallon underground cistern was leaking. We had plenty of other problems, too, but the immediate ones were what to do first and where to find out some of the things I needed to know.

I decided to spread out a little by operating some additional land on a share-crop basis. This called for additional manpower. I arranged to build a small tenant house and made a deal with Kelly Manning from the mountain section of Kentucky to move in with his wife and seven children.

In November 1947, I heard that a man had come to our county to be a soil conservation district farm planner. I hustled into town to find out what the district had to offer. After discussing some of my problems with him, I made application for district assistance.



George Dedekam at door of milking barn, one of the most modern and complete in county.

Note.—The author is a farmer in the Grass Lick community, and a supervisor of the Montgomery County (Ky.) Soil Conservation District.

Early in 1948, Mr. Ellis, of the Soil Conservation Service, came out to our farm with what he called a land-capability map. At that time, it didn't make much sense to me. Later, I learned to look at that map with a lot of interest and respect.

Ellis and I started out to make a farm plan. One of the first things I learned was that I had about 10 acres of what he called Class II land, 4 acres of Class III, and 6 acres of Class IV. The remaining 20 acres were Classes VI and VII.

In a nice way, he pointed out that all the land I had in cultivation at that time was Class VI, which shouldn't be cultivated at all. He also showed me that I had 10 acres of Class II land in good bluegrass that should be switched to row crops, and that the steeper land that I was preparing for crops should be put in grass.

I won't explain now my thoughts at the time. We went ahead and finished a farm plan that called for a great many changes, and for doing several things that were beyond my knowledge. I told Ellis as much. He promised to help me with the new ideas, and I'll add right here that he lived up to his promises. My conservation program now is just about completed as it was planned.

The first job completed on my farm probably did more than anything else to convince me that conservation farming would pay. That was building a channel to divert runoff water from about 10 acres of steep land away from a half-acre bottom that I had been unable to cultivate.

The first year in cultivation, that half-acre made a burley tobacco crop that I sold for \$650. My entire tobacco crop for 1948, as a result of making the recommended changes, sold for \$3,065, as against \$2,089 for the 1947 crop. That was an increase of \$976. The tobacco crop from the same land in 1949 brought \$4,200, or an increase of \$1,135 over the previous year. My average per acre over the 3 years increased from 1,400 pounds to 1,820 pounds. I'm giving a lot of credit for this increase to the proper use of my land-capability map, and the proper treatment of each acre.

I also started in 1948 a pasture-improvement program that included adequate water for my cattle. By studying the land-capability map, Ellis selected two possible stock-pond sites. To me this was important because in 1947 and 1948, before I had gotten around to building the ponds, I had to buy and haul water from Mt. Sterling, 6 miles away, for 2½ months of the year. This took at least 4

hours' time every other day, or 60 hours a month, plus the cost of the water and hauling. I now have two ponds that will give me plenty of water. They cost less than \$100 each.

In the meantime, I have fully treated and reseeded 15 acres of pasture and treated the other 15 acres according to what was needed, as indicated by soil tests made by the county agricultural extension service. I don't have a record of my income from dairy products for 1947, but for the past 3 years it has been: 1948, \$1,036.54; 1949, \$3,748.58; 1950, \$3,533.34.

My total income from the farm in 1948 was \$4,101.73, in 1949 it was \$7,948; and in 1950 it was \$7,960.52.

Since the farm was planned, the original water-storage cistern has been reworked and repaired and a new 5,000-gallon cistern built. Complete new plumbing and a pump have been installed. A new milk house and home-made cooler have been built. The barn has been remodeled with lounging shed, milking parlor, and hay-storage space added.

The tenant house was destroyed by fire and was rebuilt in June 1949. Two new stock-water ponds have been constructed. The main farm fences have been rebuilt and put on the contour. All cultivated crops are on Class II land, which has been terraced and is cultivated on the contour. All terraces and diversion outlets are protected by sod.

For the 15 head of cattle there are 30 acres of improved pasture, with 6 acres of alfalfa and grass mixture for hay. There are 3½ acres of tobacco and an adequate garden. Twelve persons have gotten their living from the 40 acres for the past 3 years. I have refused an offer of \$17,000 for the farm and buildings.

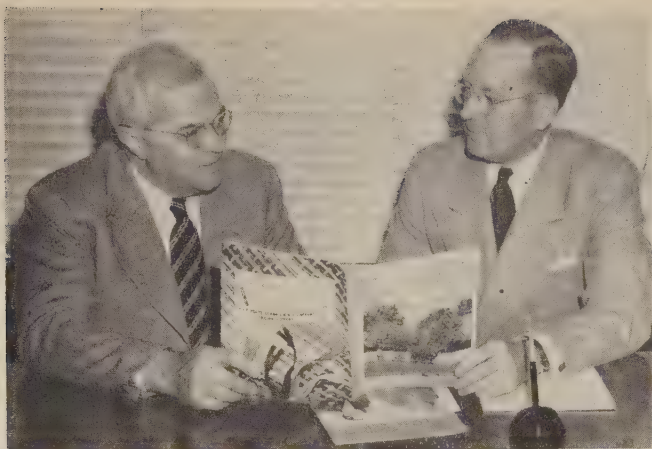
My tenant and I have done all except the bulldozer work required on the farm. We have constructed our terraces and diversions with farm implements and have made other improvements, too, with very little outside help except for the technical assistance from the Soil Conservation Service planner.

In short, my soil conservation district plan has made it possible for me to make a better living, more easily, and have more leisure time.

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**SOMETHING WORTH TRYING FOR.**—Herschel D. Newsom, Master of the National Grange, announces a Nation-wide essay contest on "Conservation Farming for Abundant Living," with





Herschel D. Newsom (left) and Paul T. Truitt.

\$10,000 in prizes offered by the American Plant Food Council, for young men and women through 20 years of age, beginning January 1 and ending March 31, 1952.

Secretary of Agriculture Charles F. Brannan will be Chairman of the National Board of Judges for the contest, other members being Dr. Hugh H. Bennett, Miss Lois M. Clark, Dr. R. Frank Poole, Dr. W. T. Spanton, Miss Jennie Williams, and Dr. M. L. Wilson.

Newsom, in a joint statement with Paul T. Truitt, president of the American Plant Food Council, said that "objectives of the contest are to stimulate new, intensive thought and aggressive action (1) looking toward a continuation and improvement of means and methods emphasizing maximum economical production while (2) at the same time stressing the conservation of our natural resources."

Prospective contestants are urged to enroll in the contest through their nearest subordinate Grange, where full details are available. In the following States contestants may enter the contest and submit their essays through their county agent, vocational-agriculture teacher, or Soil Conservation Service representative: North Dakota, Utah, Arizona, New Mexico, Nevada, Kentucky, Mississippi, Louisiana, Alabama, Florida, Georgia.

The following prizes are offered by the council: National—first prize, \$1,000 cash; second prize, \$500; third prize, \$400; fourth, fifth, and sixth prizes, \$300 each; State—first prize, \$100 cash; second prize, \$50; third prize, \$25.

Special consideration should be given to the practical application of the subject to the soils of the contestant's community, and sources of information other than actual experience must be credited by the author. Essays may not be more than 800 words and will be judged on the basis of 40 points for practical application of subject matter, 30 points for effectiveness of presentation, 20 points for originality, and 10 points for spelling, punctuation, and grammatical correctness.

**WINDOW DEMONSTRATION.**—Helping farmers rid their land of "black alkali" is one of the big problems of the Mason Valley Soil Conservation District in Nevada. In recent years, the district supervisors and Soil Conservation Service technicians have developed a way to treat "black alkali" land that will do the job, provided it is used properly and under the right soil and drainage conditions. Gypsum is used to open the soil so the alkali can be leached out.

At Yerington, headquarters of the Mason Valley district, Conservationist A. G. Bodenstein and Soil Scientist L. N. Langan put on a display in a store window which consisted of two jars, both nearly full of alkali soil. The jars had identical drainage and were given the same amounts of water at regular intervals. One jar was treated with the proper amount of gypsum, the other was not. A placard explained that 20 wheat seeds had been planted in each jar.

Shortly after the display was put in the window, 19 seeds in the gypsum-treated jar germinated and produced shoots up to 6 inches long. In the untreated jar, only one wheat seed germinated.

Most impressive to farmers who had had their land literally sealed tight against moisture penetration by black alkali was the fact that water in the gypsum-treated jar penetrated to the bottom quickly. After several weeks, water in the other jar had entered only about 1 inch deep.

The display will be exhibited in all work units in western Nevada.

**RECORD LENGTH?**—When cultivation is started in Villard McLaughlin's potato fields at Dyer Brook, Maine, there really is some work out ahead. The rows in contour strips are a mile long. McLaughlin found out that conservation farming really pays by planting one test plot on contour and another with rows running up and down the hill—same size, same day, same seed, same kind and amount of fertilizer. He got 80 more barrels per acre from the contour plot. His farm—the second planned in Southern Aroostook Soil Conservation District—contains 133 acres in strips. He is secretary-treasurer and director in the district, which he has served for more than 10 years.

**THE RAINS FELL.**—Drainage paid off in the Steele County (Minn.) Soil Conservation District following heavy rains. Four and one-half inches of rain fell in two and one-half hours. Some of the farmers in the Arnold Mortenson group report that they would have had almost total loss of crops had it not been for the drainage which had been installed with technical assistance from the Soil Conservation Service.

## SOME TIPS ON AERIAL PHOTOGRAPHY

Widespread interest has been shown in the photographs appearing on the front covers of this publication. Among the many letters we have received inquiring as to the techniques employed in their making is a recent one from D. C. G. Plowes, pasture research officer, Matopos Research Station, Bulawayo, Southern Rhodesia. Hermann Postlethwaite, SCS photographer who has made many of our cover pictures, replies to Plowes in some detail. We are quoting Postlethwaite for the benefit of others in need of such information:

"The oblique aerial views that have appeared in our magazine were for the most part taken by following a rather simple formula: (1) Focus at infinity, all objects will be beyond the infinity point; (2) lens wide open, not necessary to stop down for depth; (3) and shoot with the focal plane shutter at the fastest speed the film in use will allow, basing this speed on a meter reading taken on the ground before going up in the air.

"Answering your questions in the order you asked them:

"(a) The height of the plane is determined by the ground area desired in the picture. The lower the plane flies, the slower it should be flown to eliminate ground speed as much as possible. A good pilot can almost stand it still for the picture. Little consideration to speed is given otherwise. Where possible a Piper Cub type, small two-place plane is used.

"(b) A regular model Speed Graphic camera with focal plane shutter, equipped with a 6-inch Ektar f.4.5 coated lens, working on a 4- x 5-inch film. A between-the-lens shutter has been used with equally good results, but ground speed has to be considered a bit more then, due to the nature of the exposure mechanism.

"(c) The film was Eastman SuperXX Cut Film with an ASA rating of 100. Usually an Aero 1 or Aero 2 filter is used, depending on the amount of haze penetration needed. Actually, days with much ground haze should be avoided.

"(d) Good sharp pictures may be shot at slow speeds, even as slow as 1/25 second, but most aerial work is done at 1/400 second or faster.

"(e) No increase in exposure is taken into consideration. Actually you are not more than 500 to 1,000 feet above the ground for most agriculture shots. A prime consideration, though, is shadows to give contrast relief. Most flights are made in

the afternoon, 3 p.m. to 5 p.m., so as to take advantage of the clearer air and the long shadows cast by ground objects. A flight around the object will quickly show the point from which it has the most punch, usually about a quarter, half, or three-quarters light will give the best shadows."



U. S. Department of Agriculture  
SOIL CONSERVATION SERVICE  
Agriculture Information Bulletin No. 63

## NEW GUIDE TO CONSERVATION READING

Attention: Teachers, students, district farmers, implement dealers, civic leaders, and all others who must keep informed on soil and water conservation! Here's news for you:

Available now is a 24-page selected bibliography, tabbed as Agriculture Information Bulletin No. 63. It is the work of Phoebe O'N. Faris, and copies may be obtained from the Washington and regional offices of the Soil Conservation Service.

Thoroughly up-to-date, extensive, descriptive, and convenient in arrangement, this first printed listing of materials in its field is accurately titled, "Books, Booklets, Bulletins, on Soil and Water Conservation."

To quote the introductory note: "Probably, since the end of World War II, more has been published about soil and water conservation than in all years before. It would take a very large volume to list all the good books and pamphlets. This, therefore, is a selected list of nationally important publications. Emphasis is on accurate information and data, the newer trends and developments in our national soil- and water-conservation program, and material suitable for use in schools."





# SOIL CONSERVATION

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ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE

WASHINGTON, D. C.

MARCH—1952

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**WELLINGTON BRINK**

Editor

Art Work by

**W. HOWARD MARTIN**

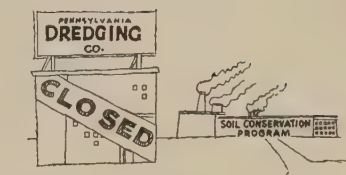
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**LESS MATERIAL DEPOSITED.**—Pennsylvania companies that dredge the bottom of the Susquehanna River for coal, sand, and gravel are getting down to the bottom of the stream bed.

"Before many more years pass," says Charles G. Downey, one of the principal river operators for a half century, "the business may be a thing of the past."

An important factor in this decline, he says, is "improved methods in soil conservation, such as plowing, planting, and cultivating to check erosion." Other factors are improved methods in reclaiming coal at the mines and the State's clean-streams program, which aims at eliminating the dumping of waste materials into streams.

Since the early thirties, according to Downey, the annual tonnage of coal, sand, and gravel removed by his company from the river bed in the Harrisburg area has shrunk from 100,000 tons to 15,000 to 20,000 tons.



**FRONT COVER.**—This improved pasture in Louisiana is part of a 600-acre stretch of Dallisgrass, Bermuda-grass, and White Dutch clover. Measures included clearing away of brush after establishment of a drainage system, and fertilizing with 300 pounds per acre of 20 percent superphosphate.

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## *Conservation, and Goals*

The 1952 production goals for American agriculture challenge us to make our land strong. This we must do not only for today but also for next year and the years to come. Our task is to bring to bear every resource of modern science and management, to the end that our farms and ranches will be safe and permanently productive. Soil and water conservation offers some of the most important of these modern scientific and management methods.

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To this knowledge let us now add a full measure of determination, ingenuity, teamwork, and devotion to the common cause.

*Robt M Salter*

# THE MOST CENTRALLY LOCATED FARM IN THE UNITED STATES

By LUTHER E. HAMILTON

**T**HE exact center of population of the United States is in a grassed waterway on the farm of Carl Snider, in the Richland County Soil Conservation District, Dundas, Ill.

Except for Snider's careful conservation work, the symbolic stake might have been driven last October in a gully, where it would have had small chance of remaining upright very long. The United States Census Bureau is fussy about the precise location of the imaginary pivot on which population balances, or on which it would balance if we all weighed exactly the same.

Carl Snider is a hard-working, intelligent, sun-tanned American who fits into the center of population exceptionally well. He is 33 years old, the youngest of five brothers, all of whom have farms in the community. Carl and June have two sons: Don, 5 years, and John, 2. They bought their 150-

acre farm 5 years ago and they're building up the soil while they pay for it. The north part is so flat that surface drainage ditches were needed in some places to take off standing water. The south half, mostly Class III land, must be protected from sheet and gully erosion.

Carl became interested in erosion- and water-control shortly after he bought the farm. With the help of Luther Hamilton, farm planner assigned to the Richland County Soil Conservation District, he worked out a conservation plan that was approved by the district directors in 1948. The surface-drainage system was constructed the same year. When one of the ditches began to scour and work back into the drainage system, it was necessary to change it to a grass waterway. This is now famous as the waterway in which the official center of population will remain until after the 1960 census. It was constructed under the supervision of Walter Zimmerle, conservation aid, in August 1951. It was fertilized and seeded to Alta fescue, timothy, and redtop.

Note.—The author is a farm planner, Soil Conservation Service, Olney, Ill.



"X" marks the spot. Center of population is at edge of waterway seeded to oats, fescue, redtop, and timothy. At left, Luther E. Hamilton, work unit conservationist, talks to Carl Snider.



Posed in front of grandstand at celebration: Carl Snider and 2-year-old John; Hon. Charles Sawyer, Secretary of Commerce; 5-year-old Don; Mrs. Snider.

Snider and Zimmerle could hardly have planned any better if their intention had been to prepare the spot for the fame that was to come to it in a few weeks. By October there was a good cover of grass.

Since Carl's conservation plan was developed, he has built 3,470 feet of open drainage ditches and 2,500 feet of grass waterways. He has also built a pond for watering livestock. On his list still ahead

are 1,000 feet of multiflora rose and other plantings around the pond, and 50 acres of pasture improvement. He follows the 4-year rotation recommended for his area: corn, soybeans, wheat, clover and grass. His seedings include 8 pounds of sweet-clover, 5 pounds of lespedeza, and 3 pounds of red-top. Carl is interested in adding humus to his soil. He applied 400 pounds of potash and 300 pounds of 4-8-12 fertilizer with his wheat and fall seedings. The directors of the Richland County Soil Conservation District considered his work outstanding enough to merit a visit on their annual fall inspection tour.

Richland County was part of a four-county soil conservation district until it was organized on a county basis in 1945. When District Chairman Frank Wade was asked to comment on the incident that put Richland County in the Nation's newspaper headlines, he said: "This brings home to us the fact that our population is growing every day, while too much of our good land is being damaged by erosion. It is time to take the necessary steps to insure that our future population will have enough food."

Carl Snider went about his daily work unimpressed by the popping of flash bulbs, the stream of autos that flowed past his farm, and the celebration held to commemorate the event. Center of population or no center of population, the soybeans had to be harvested and the livestock fed, along with all of the daily work that makes up the life of a conservation farmer.



# DISTRICT PROFILE

BROWN  
of  
PENNSYLVANIA

Frank Brown, Sr., has come a long way in 5 years. Starting with a rented 10-cow farm of eroded hillside and swampland, and relying mainly on team, corn, and plow, he now owns a complete grassland conservation farm and is the 1951 State winner of the PMA-sponsored Green Pastures Contest.

Frank, at 31, is the youngest director of the Wyoming County Soil Conservation District board, and the first president of the Wyoming County Young Farmers Association.

Raised on a Wyoming County farm, Frank drifted from farm life after graduation from Tunkhannock High School. He worked as a car salesman and welder before World War II. Immediately after his discharge in February 1946, he rented a farm and enrolled in institutional on-the-farm training of the veterans program. Each year he took full advantage of PMA payments for lime and fertilizer, and used considerably more than the PMA program provided. He purchased the 93-acre farm he was renting and started building up his herd.

With the help of Stratton B. Stevens, veterans instructor, Frank began to develop his pasture and started drainage work on the swampland. He



Frank Brown and registered Guernsey around which he has built his herd.

switched from team to tractor, and put up grass silage along with corn. Having the foresight to see the need for erosion control and water conservation, Frank worked with the Young Farmers Association to get a soil conservation district established in Wyoming County. After more than a year of effort the group was successful and Frank was named by the county commissioners as a member of the new district's board of directors. He was among the first in the county to develop a conservation plan in cooperation with his district.

Frank's prize-winning pastures are long narrow strips of Ladino-orchardgrass, leading off a lane from the exercise lot of bluegrass. His 30 head of registered golden Guernsey milkers had ample lush pasture from 23 acres this year, the driest year in the memory of many local people. Four acres are bluegrass, the remainder improved seeded pasture. In addition to furnishing adequate pasturage, much of the first growth went into the silo. Seedings are now made by breaking up the old sod with a field cultivator instead of a plow. A disk is then used and the seedings made in the dried-up sod mulch. All pastures are mowed at least six times per year and top-dressed annually. A diversion terrace was built to protect the pastures from washing and silting. A water outlet was constructed and the drainage system enlarged and lowered. A pond for stock water is at present under construction, and steep odd areas were planted to trees. This year, for the first time, the open farm land is all in grass. The meadows are used for hay and silage, and are not pastured.

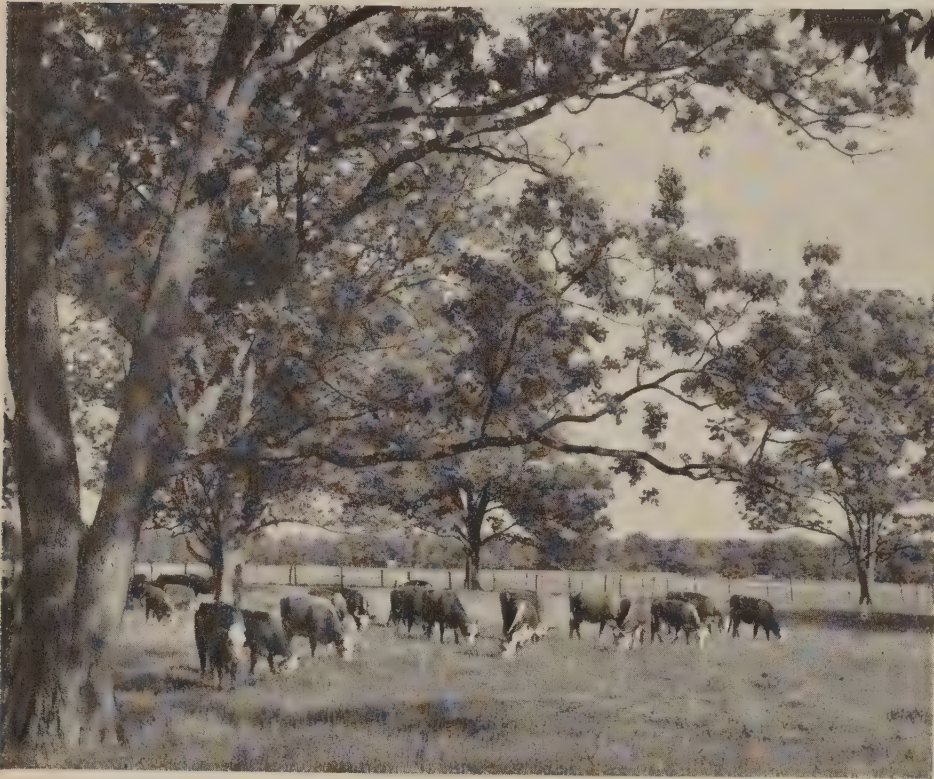
Many are the visitors to the farm. Frank, Sr., and his 12-year-old-son, Frank, Jr., together explain the program that is working so well. The son is already a future guardian of America's most precious natural resource—her soil.

—STRATTON STEVENS AND D. T. DINSMORE

**IMPRESSIVE RISE IN INCOME.**—While on a tour held in the Thornapple-Grand (Mich.) Soil Conservation District to the farm of an FHA co-operator, the FHA county supervisor had some interesting information to present. In making an appraisal of the benefits of soil conservation, he calculated that the increased income compounded for a period of 40 years would amount to over \$55,000. These figures were not questioned by the group, as evidences of the increase in production were apparent to all.



# WE PUT THE EMPHASIS ON GOOD LAND USE



C. E. Humphries gets twofold returns: pecans and beef. He is a pioneer in beef production in the Delta, and a member of the agricultural committee of the United States Chamber of Commerce.



D. B. Pitlow, in the Leflore district, finds that improved pasture and sheep pay on poorly drained gumbo land not suited to cotton. Land Use Emphasis Week stressed improved pastures as a part of conservation farming.

**F**EW events in our Mississippi community have received such widespread acclaim and cooperation as our Land Use Emphasis Week last summer. The results lead us to recommend that similar programs be adopted in other places.

With a series of sermons, tours, demonstrations, radio programs, speeches, and a barbecue luncheon, we joined in a great cooperative effort to arouse more appreciation for the basic importance of good land use in the Leflore County Soil Conservation District, which is wholly within the Yazoo - Mississippi Valley, and in the Big Sand Creek Soil Conservation District, which lies partly within that valley and partly in the bordering bluff area.

The program was sponsored by the Greenwood Chamber of Commerce and the Carroll County Chamber of Commerce through their Soil Conservation Committees. These organizations actually had to do little more than lay plans for the event, and then guide the enthusiastic efforts of many other organizations and interested individuals in bringing the week of events to a successful conclusion. The Big Sand Creek Soil Conservation District is in Carroll County.

The two districts have an integrated problem in floods and siltation that results from the rapid run-

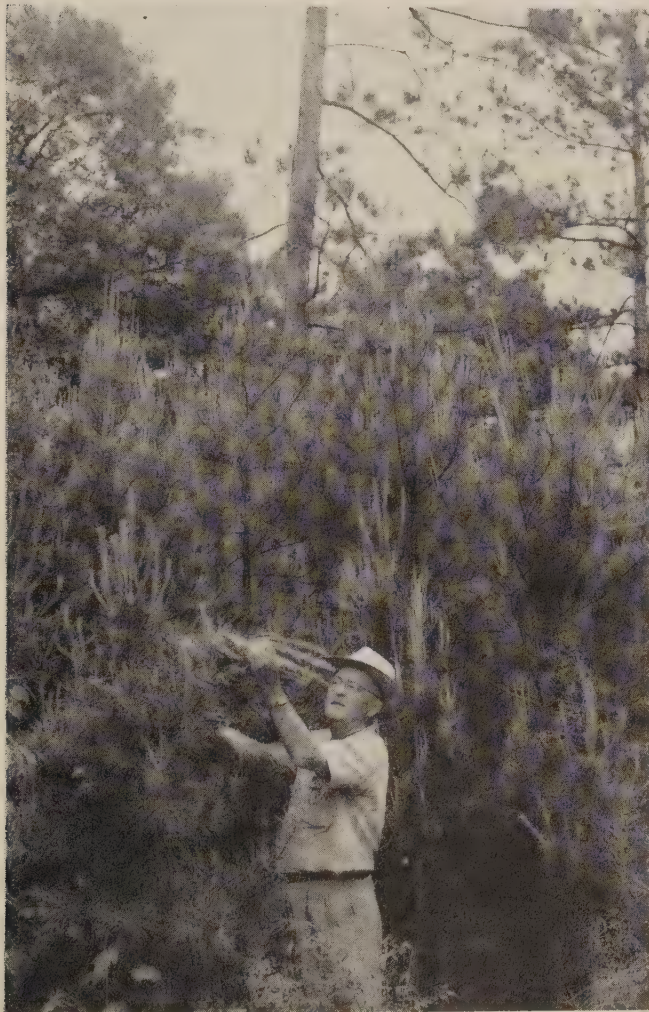


**By J. H. PEEBLES**

**President, Bank of Commerce, Greenwood, Miss.**



**Control work has started on this gully in the Big Sand Creek district. A desilting basin at the mouth of the gully holds back much of the eroding soil, while kudzu gains a protecting foothold on the raw banks.**



**This fine crop of young trees is holding the soil on G. P. Ritchey's farm in the Big Sand Creek district. Ritchey calls them his "old-age pension."**

off of rain water falling in the hills of Carroll County. This rapid runoff is hastened by the lack of vegetation on many thousands of acres of eroded and gullied lands. The siltation is the result of erosion of fields, gullies, roadsides, and stream banks.

The Leflore County Soil Conservation District faces also the problem of getting the heavier clay soils put to the growing of legumes and grasses for pasture, seed, and hay, or put to other good uses. It is a matter of great importance to the people and to the soils of both counties that good land use be practiced to keep more of the rain water where it falls, to protect the land from erosion, to realize the best income from the fields and the forests, and to prevent floods and siltation on the lower lands.

With these fundamental considerations before them, the two chambers of commerce planned this Land Use Emphasis Week and laid out a program to include sermons on good land husbandry in all of the churches of the two counties, a day of publicity to precede the other activities (when newspapers, radio, and public posters were used to keep readers and listeners reminded), and a day's tour in Carroll County to demonstrate outstanding achievements in good land use. The tour was well attended and included a fine address by T. B. Fatherree, State director of the Farmers Home Administration, who talked from the bottom of a gully on the C. E. Hoge farm, which was adopted for a project of land rehabilitation. This was followed by a midday lunch at the farm of Sidney Bussey, which was supplied by the Leflore Bank and Trust Co. of Greenwood and the Peoples Bank and Trust Co. of North Carrollton.

An afternoon tour in Leflore County gave the opportunity of observing some excellent pasture developments and livestock growing on Delta soils, as well as some fine examples of row arrangement and drainage by the use of W-ditches. A Delta tour on the following day was interrupted by rain, so the principal speaker, Sam Coker, president of the Delta Council, was heard in the courthouse at Greenwood. The introductory remarks by Hugh L. Gary, president of Wildwood Plantation, were inspired by his deep feeling for the fundamental need for safe land usage and were a sermon in themselves.

The final day was featured by a barbecue lunch, attended by more than 600, and an address by T. S.



Buie, Southeastern regional director of the Soil Conservation Service, Spartanburg, S. C., who remarked on the progress of diversification and good land use that he had been able to witness since beginning his visits to this section.

The Soil Conservation Service supplied enlarged photographs of a selected number of pictures taken in the Leflore district. These were displayed in many show windows and public offices throughout Greenwood, where they excited much favorable comment. The *Morning Star* of Greenwood published an extra section of 16 pages, replete with photographs of good land use carried as advertisements by local businesses, and containing many fine articles on conservation, forestry, and kindred subjects. The Delta Electric Power Association and all of the banks of Greenwood participated in a dinner in honor of Dr. Buie. The *Delta Farm Press* of Clarksdale, Miss., featured the event by a two-



This steep land 12 years ago was planted to kudzu. When pastures dry up during summer droughts, Alderman's livestock finds grazing here.

page spread, illustrated with pictures of diversified farming. This spread was sponsored by the three banks in Greenwood.

Yes, we recommend that other communities put emphasis on wise land use.

## IRRIGATION IN SIX WESTERN STATES

By A. E. McCLYMONDS



Land leveling on O. McKelvie-Harold Briggs farm near Clay Center, Nebr. SCS worked on plan and techniques with the Clay County Soil Conservation District. Private contractors were hired to do the job.

IN its 15½ years of existence up to January 1, 1951—a year ago—the Soil Conservation Service helped soil conservation district cooperators bring almost 588,000 acres of new land under irrigation in the Northern Great Plains States—Kansas, Nebraska, the Dakotas, Montana, and Wyoming.

In addition, the Service helped improve the irrigation systems on 456,000 acres that already were

under irrigation, in order to conserve soil fertility and water. District cooperators received technical assistance on work involving over a million acres of irrigated land.

More than 340,000 acres of the newly irrigated land were developed as parts of individual soil and water conservation plans. The rest—247,000 acres—was developed as “group facilities,” where several farmers and ranchers worked together.

Figures on the new land brought under irrigation, by States, up to January 1, 1951, follow:

State	Individual Conser-	Group	Total
	vation Plans	Facilities	
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Kansas .....	43,216	.....	43,216
Montana .....	61,799	192,597	254,396
Nebraska .....	194,537	.....	194,537
North Dakota ....	2,067	.....	2,067
South Dakota ....	6,994	7,776	14,770
Wyoming .....	31,667	46,941	78,608

These figures are exclusive of land developed under the Case-Wheeler projects, where nearly

Note.—The author is regional director, Soil Conservation Service, Lincoln, Nebr.



30,000 acres had been brought under irrigation. In these projects, the Service developed the land, established the irrigated farm units, and sold them. The Bureau of Reclamation developed the irrigation water supply and the main canals and laterals to distribute the water.

Full impact of this new irrigation development on the productive capacity of the region—especially important now because of the defense program—is not told in those figures, however. It is important, of course, in enabling the land to produce more. But some of it influences the use of thousands of acres of range land, facilitating this land's management for the conservation of soil and water and the greatest sustained projection.

Ted Butterfield's ranch near Beulah, Wyo., is an example. Butterfield is one of the supervisors of the Red Water Soil Conservation District. Irrigation of alfalfa with water from a spring and a small creek has doubled the hay yield and rid him of a winter-feed bugaboo. Service technicians helped him develop the water supply, as well as the irrigation system.

With his increased feed supplies, and the seeding of cool-season grasses for early spring grazing, he is able to defer grazing of the native range each spring until the grasses have made a vigorous growth. He also follows other range-improvement practices, among them being better cover for the land, conservation of more water, and better grazing.

Inasmuch as nearly all of this new irrigation is on small farm and ranch developments, and enterprises involving two, three, or four individuals working together, considerable ingenuity has had to be shown by the technicians in aiding the district cooperators.

It has been pretty much a case of making use of irrigation water wherever found, provided it is near land suitable for irrigation. The developments include such things as using water from springs, from small streams whose flow is actually too small for irrigation, pumping from wells and open water, making present available water supplies serve more land, aiding State agencies assisting groups with larger enterprises.

Actually, the water supplies, as well as the land, had to be developed for about four-fifths of the new land brought under irrigation. The rest is land that was already under irrigation systems, but which could not be irrigated either because the

water supply was insufficient under the irrigation methods then in use, or because the land could not previously be reached due to improper design of the system.

One of the smaller developments is on the Ralph Slemen farm in the Mineral County Soil Conservation District in western Montana. Here the SCS technicians designed a storage dam to take the flow of a stream that is too small for successful irrigation by merely diverting the water. The stream



This drop structure on the R. E. MacLeod farm near Torrington, Wyo., illustrates how it is possible to control the speed of water being brought from the supply canal at the top of a grade down to the land to be irrigated.





**Glimpse of land under improved irrigation on farm of Dr. E. A. Hodges, in the Yellowstone County Soil Conservation District, near Billings, Mont. Like so many of the irrigation developments in which SCS has aided farmers and ranchers, this farm is devoted principally to the production of feed for livestock, and as a result it has a decided influence on the management of an extensive amount of dry-land range.**

lacks enough head, or volume, at the turn-out gate, and it goes almost dry in summer.

By storing the water, enough volume is accumulated to give Slemen's alfalfa a good wetting in spring and a second irrigation later on in the year to assure a second cutting.

Not far away, near Alberton, in the same soil conservation district, is one of the most unusual developments. It is on the Fred Thompson farm, which consists of about 70 acres of bottom land and some land on the steep mountainside above. Many years ago, Thompson's father had stored the flow from one of the mountainside springs in a catch basin and had irrigated a little less than half of the land.

Aided by specifications provided by the Soil Conservation Service, Thompson now pipes the water from two springs up the mountainside into a sprinkler irrigation system on the bottom land, nearly all of which is now irrigated. Thus, Thompson now has a sprinkler system with the water pressure supplied by gravity. It can be operated 24 hours a day.

Much of the new land brought under irrigation had previously been dry farmed, and some had never been farmed at all.

One of the former is the M. M. Snyder farm near Hastings, Nebr., in the Adams Soil Conservation District. The Soil Conservation Service made a detailed map of the farm, selected the proper place for an irrigation well, and supplied the technical services for leveling 40 acres. Gated pipe is used for irrigation.

"Two years ago, this place was dry-land farmed," Snyder said last fall. "Today all but 10 acres are irrigated."

Mark Watson of Glasgow, Mont., cooperating with the Nashua Soil Conservation District, is one who is bringing under irrigation land that had not been cropped before. Instead, most of the 150 acres he now irrigates was formerly low-producing range, having much sagebrush and little grass.

Water is pumped from the Milk River. Location of the pump, design of the farm lay-out, and technical phases in the development of the land for irrigation were handled by the Soil Conservation Service.

Otto Geeseka near Scott City, Kans., by improving his irrigation system and properly preparing his land for distribution of water, increased by one-fourth the irrigable area of his farm. He is a coop-



erator with the Scott Soil Conservation District. In addition, the improvement made it possible to irrigate better, more rapidly, and with less water. Geeseka gets his water from wells and can increase the amount pumped at will.

Not so with Roy Taylor, near Mountain View, Wyo., cooperating with the Bridger Valley Soil Conservation District, who depends on irrigation for his hay supply. At the time he sought aid from SCS through the district, he was irrigating all the land he could with his available water supply, which comes from a stream.

As a result of redesigning the irrigation system and improving irrigation methods, Taylor now irrigates more land than he could before. There also has been a decided improvement in the grasses in the meadows.

Not only is Taylor getting better hay and more hay from the land he previously irrigated, but he also is getting production from land that didn't produce before because of the lack of irrigation. The hay is Taylor's principal winter feed supply, and the amount he can raise has a big influence on his year-round cattle operations.

In the case of Chris Ohmstede near Guide Rock, Nebr., in the Webster Soil Conservation District, SCS technicians helped enlarge an irrigation system, supplied by impounded runoff, that was built in 1931. First, they surveyed the drainage area to determine the water-storage possibilities and designed an enlarged dam to meet the situation. Then, they designed an improved irrigation system to serve both the land already irrigated and the new land brought under irrigation.

Work in improving existing irrigation systems has included better and more uniform distribution of water, installation of structures to prevent erosion by irrigation water, new flumes, and new turn-out gates to deliver water to the fields at the right places and in the right amounts.

One of the farms on which improvement was made of an existing irrigation system is that of W. W. Thompson, near Belle Fourche, S. Dak. Thompson is in the Boyd Soil Conservation District. He reports that where formerly he needed a number of irrigation ditches in each field, and still did not get good distribution of the water, he now gets uniform irrigation with only one or two ditches per field. More than that, he finds that irrigation is much easier and erosion is no longer a problem.

Altogether, the aid given to irrigation farmers

and ranchers involved technical services in leveling 270,000 acres, lining half a mile of ditch, developing 2,460 irrigation wells, installing 23,055 irrigation structures and 1,509 surface-water pumps, building 13,830 miles of irrigation supply and field ditches and 2,463 irrigation dams, and improving the irrigation methods on nearly 750,000 acres.

The demand on soil conservation districts for the aid of the Service in soil and water conservation and development of water resources has continued to increase from year to year. The work done in 1950 was about one-sixth of the total amount that has been done in all 15½ years.

One thing in particular marks all of these irrigation operations. They are all founded on an analysis of the capability of the land—that is, its suitability for use under irrigation. Land capabilities are the first thing to be determined in developing a complete, coordinated soil and water plan for a farm or ranch unit.



**POSED AT MEMPHIS.**—Immediately after becoming Chief of the Soil Conservation Service, Dr. Robert M. Salter attended the national convention of the Soil Conservation Society of America, held at Memphis, Tenn., in the fall. There he met or renewed acquaintance with conservation leaders from many parts of the country.

In this photograph Salter is seen with some of his SCS staff. Seated at his left, hands clasped, is his deputy chief, J. C. Dykes. Standing, left to right, are A. L. Patrick, regional director, Upper Darby, Pa.; T. S. Buie, regional director, Spartanburg, S. C.; E. H. Graham, assistant chief; E. A. Norton, assistant chief; and R. H. Musser, regional director, Milwaukee, Wis.

A profile, "Bob Salter: A Friendly Man of the Soil," appeared in our February issue.



# HOW A TEXAS DISTRICT RIDES HERD ON FLOODWATERS



Hon. Sam Rayburn speaks on flood control.

By JOHN H. JOHNSON

**F**ARMERS of the Collin County Soil Conservation District, in northeast Texas, are proud of their part in helping to control floods on the Trinity River watershed. So they invited everyone to see what has been done on their land and to hear about the value of flood measures to all of us.

Part of the celebration was a motorcar tour of the eight detention structures that have been built on Honey Creek, tributary of Trinity River's East Fork. Two more such structures will be built on

Note.—The author is district conservationist, Soil Conservation Service, McKinney, Tex.

Honey Creek. In all, 27 detention structures are planned for the East Fork above Lavon Reservoir, which the Army Engineers are building downstream just north of Dallas. The detention structures tie in with the big reservoir.

Technicians of the Soil Conservation Service select sites, design detention structures, and supervise their building by private contractors. Included in the flood-control program are drop inlets, sedimentation basins, floodways, terracing, diversions, farm ponds, and other engineering features. These mechanical measures complement such vegetative features as the seeding of grasses and legumes on fields taken out of cultivation, the development of cover and soil-improving crops, the installation of conservation crop rotations, and the restocking of farm woodlands. All the work is carried on by direction of soil conservation districts. Underlying the program is the principle of using and treating the land to achieve both safe and permanent production.

After the tour there was a barbecue. Principal speakers were Sam Rayburn, Speaker of the House of Representatives, and J. C. Dykes, deputy chief of the Soil Conservation Service. Speaker Rayburn has a farm nearby. Part of the program was broadcast nationally.

"I have always said," Speaker Rayburn told his large audience, "that I would not like to own a bottom-land farm because it floods so much. But this afternoon I saw bottom land that will never



Board of supervisors of Collin County Soil Conservation District: Chester Loughlin, Howard Logan, C. E. Cantrell, John D. Wells, and Chairman Arlus L. Gambrell.



flood again. That land will produce well and dependably. It will do this locality good. It will do the country good."

Dykes told of the work done by Speaker Rayburn and Roland Boyd on legislation to authorize the Honey Creek work which the crowd had seen during the tour.

Dykes called attention to the costly floods which in the past 5 years have inflicted more than 3 billion dollars in damage to crops, land, and other resources.

"Those bottom lands, like the ones you see around here, are our best lands, our most productive," said Dykes. "We can't afford to have them damaged. We've got to do this job of flood control now to avoid the necessity of having to do a bigger and more costly job later.

"We know that we can control small floods and reduce big ones. Land treatment alone is not enough. Upstream work alone is not enough. Neither are dams and levees on the main stems. We must have both together."

Dykes estimated that the Honey Creek program would bring benefits of \$7.12 for each \$1 of cost. And the East Fork program above Lavon Reservoir would bring \$10.12 in benefits for \$1 of cost.

The people of the Collin County Soil Conservation District, and those of other districts of the Trinity watershed, have seen the wisdom of getting together to prevent future large disasters from rampant waters.

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**POND SAVED SITUATION.**—In midsummer, 1951, 5 years after he had built his farm pond as an auxiliary source for water for cattle, T. P. Gray, Pursley Creek farmer in the Upper Ohio Soil Conservation District, W. Va., figured that he had a "white elephant" on his hands.

When Gray inspected his herd late in September, he found that the springs from which the animals drank had gone dry—the first time in years. On shifting his cattle to the farm with the pond, they rushed in and began to drink; obviously, they had been without water for a long time.

Lacking the pond, Gray would have had to buy water and pay for having it hauled, or else he would have had to move the cattle to a rented pasture containing water, or put them on the market at once at a financial loss. From any angle, the value of the pond investment was proved. There is no more talk of its being a "white elephant." Lately Gray has stocked it with fish, so that he also will have recreational advantages.

# DEEP PLOWING IN ITALY

By GROVER KINZY

THE Italian practice of deep plowing, 1 meter deep, is so different from American practice that it arouses comment, wonder, and a desire to know what results it produces. The hypercritical observer should be warned that this, like many other "peculiar" practices, comes from a nation whose agriculture was over 2,000 years old when Squanto flopped the first fish in a New England hill of corn.

Deep plowing has been observed on very shallow limestone land underlaid with a soft but impenetrable-to-water limestone called in Italy "tufa," which can be pulverized soon after plowing. It also occurs on alluvial sandy soil underlaid at 1 to 2 feet with a 2- to 4-inch layer of iron conglomerate—a soil similar to the Leon or St. Johns in the United States. Again, it is seen on heavy red clay land both on the slopes and in the valley where soil from the slopes has accumulated, and on alluvial gravelly slopes and bottoms, and on loamy-sand or sandy-loam bottoms being reclaimed. In these instances, the land has been plowed a meter deep with an immense plow pulled by one or more heavy crawler-type tractors or by two steam engines using a cable. This is known as the Fowler system, said to have been introduced from England.

In other instances, I have seen much land being worked by hand 30 to 36 inches deep, the stone and stumps being removed in the process but the fundamental purpose being to loosen the soil. No particular attention is paid to keeping the topsoil on top during such operations.

Obviously, in the first two cases results should be beneficial. The soft limestone is of volcanic origin and rich in minerals. The soil body is permanently deepened and about the only loss is a little organic matter. However, some operators prefer scarification a meter deep to plowing. Some scarify only one way; others also cross-scarify. Teeth about 18

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Note.—The author was formerly zone technician, Soil Conservation Service, Northeast Region, Upper Darby, Pa. Kinzy in 1951 completed 2 years with ECA in Italy, where he served as agronomist on various agricultural projects.

inches apart are used. The cost of two-way scarification is greater than that of plowing. Breaking and removing the impenetrable iron layer from soils underlaid with it allows plant roots and moisture to penetrate. No large amount of organic matter is buried, as these soils have not produced much in recent years.

Red clays and alluvial, colluvial gravel soils are deep-plowed to loosen them up for better aeration and drainage and there is considerable feeling that exposing subsoil and parent material to the sun makes soil of it rapidly. Some operators turn the clays when dry and leave them exposed for about 3 months, then replot. They seem to feel that it is unnecessary to plow so deep as at first; obviously, the topsoil is left buried. There seems to be no recognition of the value of topsoil. The main idea is to make a deep, loose soil body, then manure it until it is productive. This principle is taught in the colleges and is tied in with keeping more and more livestock so as to have more and more manure to enrich the soil and increase production. Some proponents say land should be deep-tilled every 6 to 10 years. This is done on some small holdings, but usually deep plowing is confined to new land—land cleared of brush and some trees, and rock, or land formerly used for pasture. Around Rome, however, some land that has been cultivated for ages is finally deep-plowed. This is to remove the "tufa" rock and get a deeper soil body, as discussed previously.

The recommended practice for preparing land for fruit trees or vineyards is to trench the row site a meter deep and a meter wide, put a foot of stone in the bottom of the trench, unless the land is sandy or gravelly, then a foot of manure, then fill the trench as the tree is set. This work is always done by hand and is often subsidized by the government under an unemployment law for the benefit of seasonal farm laborers. The practice is said by farm advisers to pay for itself in 7 years in increased production; comparison of neighboring orchards and vineyards where this treatment has and has not been applied supports the statement. The farm advisers are getting many of these new plantings across the slope on grade. Sometimes the grade is an accurate 1 percent, but more often it is just across the slope, more attention being paid to even-width rows than to a definite grade.

The deep-tillage practice is largely confined to new lands, as noted already. The usual farm prac-

tice is to plow about 12 inches deep on the better farms and 4 to 6 inches where plowing is done with one span of oxen or a light team and a plow.

In considering the merits of deep tillage, the fundamental Italian and American conditions must be considered. In America, it probably would not pay to remove the iron layer from Leon and St. Johns soils. In Italy the removal adds to the needed acreage of productive land. In America it would cost too much to trench, stone-drain, and deep-manure trees and vines. Land would be used for these crops that did not require such practices or we would try for the same effect by terracing and green-manuring. American subsoiling and deep-tillage experiments have indicated that such methods are not effective, that in a few years the subsoil condition is the same as before. Have we conclusively proved this? It would at least be interesting to run some Leonardtown soil a meter deep, expose it for a season, and then bring it into production. The same would be true for Aura and other soils with a layer impenetrable to air, water, and roots.



**EDITORS HONOR BENNETT.** — Dr. Hugh H. Bennett, center, former Chief of the Soil Conservation Service, and now Special Assistant to the Secretary of Agriculture, receives the 1951 Distinguished Service Award presented in November by the American Agricultural Editors Association. The award was presented by Ferdie Deering, right, editor of the *Farmer Stockman*. Deering is immediate past president of the AAEE. At left is C. L. "Cap" Mast, editor of *Agricultural Leaders Digest* and executive secretary of the Editors Association.

Dr. Bennett was chosen from among many candidates nominated for the honor.



# YOUNG HAWAIIANS SHOW HOW TO COPE WITH KONA STORMS

By NORMAN K. CARLSON

“**W**HICH is heavier, a bucket of wet soil without humus or a bucket of wet soil with lots of humus?”

Richard Diorec considered the question carefully and then replied, “I don’t know which is heavier but I know that the soil with lots of humus will grow the most crops, won’t wash away, and will hold the water.”

With this final question and reply, he and his team mate won the agricultural demonstration contest at the twenty-first annual meeting of the Hawaii Future Farmers of America.

Richard Diorec, a Hawaiian-Filipino boy, and James Muramoto, a Japanese-American boy, were juniors at the Molokai High School, Territory of Hawaii. Their agricultural education was under the able leadership of Robert Fukuda and Erle Parker. Fukuda and Parker had taught the boys what happens to soil that is not used properly.

Back of the high school’s new dairy barn there is a small pasture that has been terraced, grazed in rotation, and never loses any soil. The school has about 30 acres of corn and last year it was planted on the cross slope and very little soil was lost.

There had been no rain of any appreciable amount on Molokai for 10 months. The rains came in January 1950 and it was a very wet month. Richard and James could see from the high school the results of poor land use. The sea was colored red with thousands of tons of rich Molokai topsoil. Their school pasture hadn’t lost any soil and the cornland had lost very little. They were primed for their demonstration on erosion.

Here is part of the talk by Richard and James, entitled “Land Uses and Water Erosion.”

“We have filled our first two demonstration boxes with ordinary topsoil from a garden. We made contour furrows in this box to show you some of the good effects as well as the dangers of plowing steep land, even if it is farmed on a contour. In

the last two boxes we have placed sod and built a miniature forest. The soil in these boxes has already been saturated in order to produce quickly the effect of continued heavy rain. As we sprinkle these plots, the water will be applied faster than it falls in a normal rain, but not so rapidly as it often comes in one of our driving Kona storms.” (The normal winds in the islands are from the northeast which are called trade winds. Once or twice each year the winds come in from the south, bringing heavy rains. These are called Kona winds and Kona storms. Kona means “south.”)

“If we lift the back of this 40-inch box 1 inch, we have made a 1 to 40 or a 2½-percent slope. If the soil is loose and porous and not already saturated, most of the water from a normal rain will be absorbed, but when a driving rain occurs, there will be some washing, even with this gentle slope. If very much of the land in a field is steeper than 2½ percent, ordinary up-and-down farming will cause a lot of topsoil to wash away.

“Adding another inch changes this box to a 5-percent slope (2 to 40). We have only doubled the slope; yet the same amount of water, applied the same way, will more than double the amount of soil lost. Land as steep or slightly steeper than this can be farmed successfully, year after year, if it is laid out properly with some type of contour farming. It will do quite well planted to a grain crop if we either leave the stubble and straw on the ground, or plant fall grain or some type of cover crop to protect the soil during the rainy winter season. If cultivated rows were made up and down the slope, the erosion would be much worse than it is with the land smooth.

“By doubling the slope again and making it 10 percent (4 to 40), we once more reduce the amount of water absorbed and again more than double the amount of soil lost. This is true because water that is moving rapidly carries soil particles much easier than if it were moving slowly. Land this steep or steeper can be used for cultivated crops only by a carefully laid out contour method of farming.

“If it is used for grain, the soil loss, at times, will be excessive; while row crops, running with the

Note.—The author, now on military duty, wrote this while working as work unit conservationist, Soil Conservation Service, Kaunakakai, Molokai, T. H.



**Richard Diorec (left) and James Muramoto with demonstration equipment: water can, boxes of simulated land and cover, jars to show color of water discharge.**

slope, will carry away tons of good topsoil in every heavy rain.

“By adding another 2 inches, we change this to a 15-percent slope (6 to 40). This is nearly the extreme limit of land that should be plowed for cultivation. The muddy water running off at the bottom of this box explains quite fully why so many large farming areas in the United States have been almost entirely ruined in the last hundred years. Land this steep should be used primarily for hay crops or something of a similar nature which protects the soil. If it is ever used for cultivated crops, we must practice not only careful crop rotation, but also intensive soil conservation treatments such as strip cropping, trashy fallow, mulches, carefully laid contour ditches, and drainage channels to carry off surplus water. The erosion on steep land is worse on long hills since the amount of rain water accumulates as it goes, and the longer the slope the greater the speed of water at the bottom.

“We have made contour furrows and broad-based terraces in the second box, in order to show you that these good farming practices help greatly in holding back the water that would run off if they were not there. On porous, fertile soil, in an ordinary rain, practically all of the water will be absorbed and there will be very little soil erosion. However, in a hard, driving rain, or one that continues over a long period of time, the water may begin to break over the contours, unless we have provided drainage ditches to carry off the surplus and distribute it where it will do no harm. If this occurs, the damage may be even greater than if we had no contours at all. We were unable to build

drainage ditches at the sides of this box, so the effects of broken contours are quite evident.

“The third box we have filled with sod so as to make it as nearly as possible like good pasture land. We will deliberately make this a 30-percent (12 to 40) slope, which is nearly twice as steep as land that should ever be plowed. In spite of the fact that these sods have only recently been cut and placed in this box and that there is some loose dirt, you will notice that the water which runs off at the bottom of this box is almost clear. If contour furrows are made in a steep pasture and the banks are well sodded, practically all of the water will be held, to soak into the soil, even in a hard, driving rain.

“If we avoid overgrazing and trampled spots, there will be almost no erosion on good pasture land, even if the slope is much greater than 30 percent. By adding another 8 inches to the back of this plot we make it a 50-percent slope (20 to 40), and still there is a comparatively small loss of soil. However, in spite of the fact that the grass tends to hold back the water, a great deal of it runs off from the steep slopes and carries with it the plant foods on the surface that are easily dissolved. For this reason, it is much better to use terraces or contour furrows on steep pasture land so as to hold the runoff water until it is absorbed.

“In this last box we have created forest conditions, as nearly as possible, by covering the soil



**Severe erosion on already saturated pineapple field, caused by 4- to 6-inch rain which fell in about 24 hours in January 1950. The pineapple companies are continually reducing this type of erosion by improved field layout, contouring, trash-mulching, and grassed water-disposal ditches.**



with leaves and leafmold and by using branches for trees.

"By adding 18 inches to the back of this box, we make it a 45-percent slope (18 to 40), nearly three times as steep as any land that should ever be plowed. As rain falls in a forest area, the trees, as well as the leaves on the ground, break its driving force and tend to hold back the water, while the leafmold in the topsoil aids greatly in absorption. Small plants generally grow thick enough among the forest trees to protect the soil, but even when there are only a few small plants, there will be very little loss of soil on slopes as steep as this if there is a good covering of leaves and leafmold.

"In areas that are planted to trees, contour ditches or terraces will help a lot in holding the water and preventing erosion, especially during the time that the trees are getting started.

"All too often the owner of a piece of well-protected woodland, feeling that he needs cash to buy a new automobile or a piece of machinery, will cut and sell all of his timber at one time instead of harvesting it over a period of years. Within a few months the loose leaves will blow away and much of the leafmold will disappear.

"When the spring rains come, the thin layer of humus and topsoil which has been slowly accumulating under forest conditions may be washed down to bury the good cropland below, leaving behind a bare, rocky, gullied, and worthless hillside.

"Land as steep or steeper than this should be used for pasture land only when grazing and trampling is carefully controlled. Most land this steep or steeper should be used principally for watershed, game refuge, or recreational areas. When timber is cut from steep areas, only scattered trees should be cut at one time, so that the soil is never left bare and unprotected.

"You have seen the disastrous loss of soil which may occur when steep land that should have remained in pastures or forest is plowed and cultivated. The value of good contour farming is evident. Scientific information on soil conservation is readily available to everyone. In most cases those who make their living on the land may have the help of specialists for the asking. Common sense and simple devices will often help.

"Unless every American makes it his business to do everything possible to control erosion, it will continue for years to come, leaving behind ruined land, lowered production, and abandoned farms."

# SEEDING SAND LOVEGRASS FROM THE AIR



Airplane takes 2½-mile run in seeding sand lovegrass.

By **GEORGE S. ATWOOD**  
and **LESLIE E. JOHNSON**

UP TO 2,000 acres of grass seeding per day is done on the Land Utilization Project in Morton County, Kans., in which the federally owned land is administered by the Soil Conservation Service. A fleet of one-way plows and an airplane cooperate in this work.

In 1938, when the Government began developing the 102,500 acres of federally owned land in the project, there were many unsolved problems involved in large-scale revegetation. Emergency stabilization of drifting sand then took precedence over seeding.

Range reseeding with native grasses was comparatively new, suitable seeding equipment was not available, and seed sources were limited. Grass drills capable of seeding all types of native grasses are largely a product of the last 15 years.

The job in the Morton County LU Project involved not only cropland to be seeded, but also the reseeding of range lands where sand sagebrush, soapweed, and dropseed had replaced the useful native grasses. How to get rid of the brush, and

Note.—The authors are project manager, Soil Conservation Service, Elkhart, Kans., and district conservationist, Soil Conservation Service, Liberal, Kans., respectively.



prepare a seedbed without creating a wind-erosion hazard, presented a knotty problem.

Various types of drills and broadcast seeders were designed and built by the Soil Conservation Service. Experience brought improvements. Implement companies began to enter the field and highly satisfactory machinery gradually evolved.

Reseeding of the range was first tried without preparing a seedbed. Then were tried mowing, railing, and disking, and finally, one-way plowing. While this evolutionary process was going on, the airplane came into use as a means of broadcasting seed.

Longley and Atkins (SOIL CONSERVATION, June 1950, pp. 258-260) described the initial trials with the air seeding of sand lovegrass on the sandy lands of southeast Kansas, in which soil conservation districts and SCS cooperated. Results obtained by air seeding on lands that had been prepared by one-way plowing, coupled with a need for rapid completion of the seeding job on the Morton County LU Project, bring us to the summer of 1950.

A contract for one-way plowing of 15,000 acres of sagebrush-infested lands in the project was awarded at 77 cents an acre. The contractor moved in two crawler-type tractors, each pulling three 9-foot plows. By operating around the clock, he was able to plow 320 acres a day. The depth of plowing was regulated so as to leave three-fourths of the vegetation on top as a surface mulch to eliminate the possibility of soil blowing.

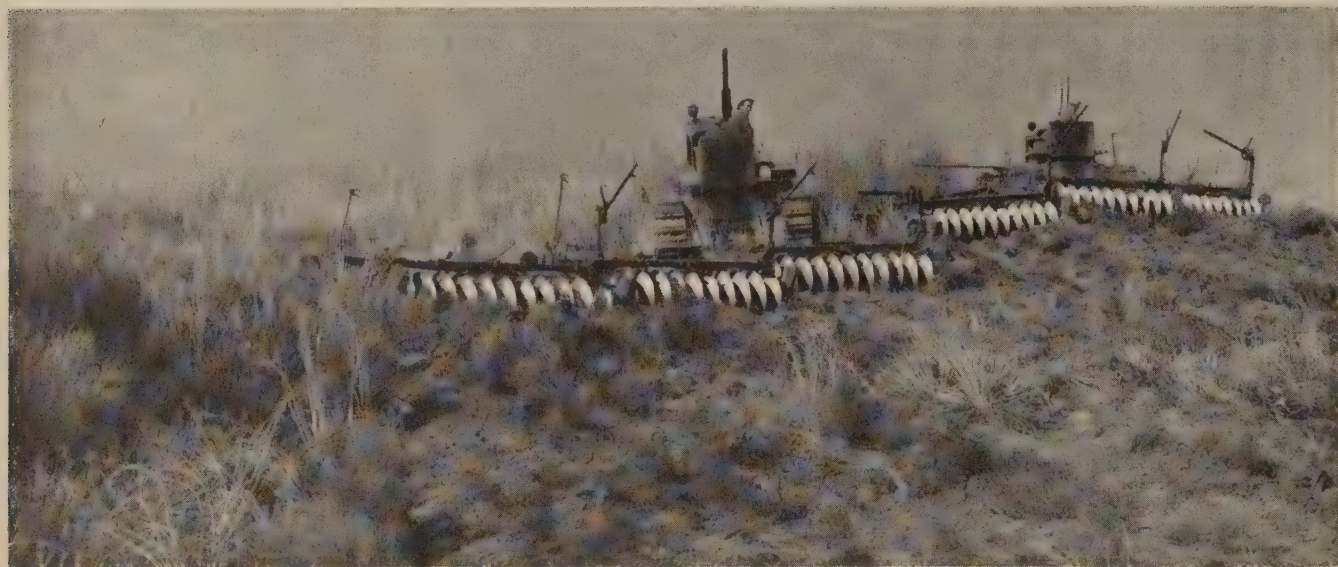
The harvest of sand lovegrass seed needed to sow the big acreage was carried out by the SCS with equipment available on the project, supplemented by contracting the combine-harvesting of 400 acres at \$4 per acre. Thirty-eight thousand pounds of sand lovegrass seed were harvested with the project and contract equipment at a cost of about 7.5 cents per pound, not including a land-rental charge. This compared with a price of 40 cents per pound on the commercial market.

The air seeding was done in November and December 1950 on 16,000 acres at 23 cents per acre. The Service furnished the flagman and delivered the seed to the flight strip. The contractor used a small plane, carrying 500 pounds of seed each trip. With this equipment, the seeding was done at an average rate of 2,000 acres per day.

The seed was broadcast on the one-way plowed land at a rate of 2½ pounds per acre.

Flight strips averaged 57 feet wide and the plane was flown at an altitude of 50 to 60 feet, with runs of from ½ mile to 4 miles in length. With the plane making runs of this type and at the altitude flown, it was possible to do the flagging with three or four men. A good pilot can fly a fairly straight line when flagged at each end of the flight.

Preparing and seeding the land by contract methods has resulted in a considerable reduction in the cost per acre. The use of larger equipment for one-way plowing, with lower labor costs per unit, made this reduction possible. Such SCS equipment as



Nine-foot one-way plows turn sand sagebrush, dropseed, and soapweed (yucca) in preparation for air-seeding sand lovegrass. A trashy mulch remains to help prevent soil blowing. (Photo by Cannon, of Southwest Daily Times.)



was available for one-way plowing consisted only of small crawler-type tractors, each capable of pulling only one 10-foot one-way plow. Distance from project headquarters reduced the actual operating time per day for tractor operators.

The airplane as a seeding machine has obvious advantages over ground equipment on rough sand-hill land. The 23-cents-per-acre contract price, plus 2 cents per acre for the ground crew, making a total seeding cost of 25 cents per acre, cannot be approached by ground-seeding methods.

While experience has demonstrated that drilling

results in more rapid establishment of uniform stands of sand lovegrass, it is believed that the reduction in seeding costs and the ability to cover large areas in a short time justifies airplane seeding of sand lovegrass.

The lovegrasses, because of their small, round seeds, are peculiarly adapted for this sort of seeding. No effort has been made to seed other kinds of grasses by air on the project. Because of its ability to volunteer readily, lack of a uniform initial stand of lovegrass is not so important as it would be with other grasses which produce seed less prolifically.

## “KING” COREY RULES NEW ENGLAND’S VERDANT FIELDS

By HUGH F. EAMES

**M**ANUEL V. COREY, conservation farmer, is king of New England’s 3,482 green-pasture builders. He owns Whitehall, one of the area’s oldest farms, near Newport, R. I. Berkeley House, his home, is the old White Hall Society house which was built 222 years ago by Dean George Berkeley, British philosopher.

A native of the Azores, Corey came to America 30 years ago and went to work as a nursery laborer at \$4 per day. After 6 years, he married, started a family, and began to put aside money to buy the stock and equipment and lease the Frank Nunes, Jr., farm along Wyatt Road, at Middletown, about 5 miles from Newport. That was in 1928.

It was in 1949 that he bought nearby Whitehall from Walter K. Phelps. The conservation survey made for Phelps showed non-stony glacial till soils from slates and similar rocks. Most of it was of medium texture and was well drained, the remainder imperfectly or poorly drained. The land was level and gently rolling. Erosion ranged from slight to moderate, with occasional gullies in one part. One piece of wet land was a prime headache.

While there was a complete conservation plan ready, not much had been done to establish it, be-



**These stones came out of the fields at Whitehall Farm. Behind Corey can be glimpsed some of his fine pastures and dairy cows.**

yond improving 14 acres of wet land through 1,900 feet of stream-channel work. This was a big factor in Phelps’ winning fourth place in the 1948 Rhode Island green-pasture contest.

At the Nunes farm, Corey’s progress in conservation farming had been about like Phelps’. He had the plan but did little with it because it was a tenant farm where he did not expect to remain and did not want to make permanent investment. There the emphasis was on potatoes, with dairying as a side line. He grew corn for silage.

Corey continued the same type of operations at Whitehall until late in 1950, when he asked the

Note.—The author is in current information, Soil Conservation Service, Upper Darby, Pa.

Eastern Rhode Island Soil Conservation District to have a new plan made. With the help of Howard O'Connell, SCS technician; County Agent Herbert Peabody; and Frank Arruda, dairy farmer and PMA county chairman, he began the switch from potatoes and corn to dairying and grassland farming. He eliminated corn for silage, cut down potatoes to 3 acres in 1951, and will have none in 1952. From now on the Corey farm will be an all-grassland operation. There is more profit in using the land for pasture than for potatoes, Manuel finds.

In 1951 Corey established 8 acres of contours, improved 1 acre of pasture, established 20 acres of permanent hay, put 41 acres of pasture under a management program, and seeded 1 acre of pasture.

The well-balanced pasture-hay program is the backbone. There are more than 50 acres of Ladino clover pasture, and 35 acres of alfalfa and red clover in combination with grasses for second and third cuttings of hay. The first cutting serves to fill two silos. The second cutting, started in May, produced 3,200 bales of excellent hay last year. Production of silage and hay is more than he can use on the farm, so some is marketed. That's why Corey is preparing to add 28 milkers to his herd of 44 cows and 28 head of young stock. It is a mixed herd, mostly Holstein, in which a registered sire is used. Last year the average production was 10,567 pounds of milk and 395 pounds of butterfat.

Corey gets top production from his pasture and hay land because he treats it right. He has built it up through spreading as much as 800 pounds of 0-20-20 fertilizer per acre. He is dropping back to an average 600 pounds next time. He fertilizes in the spring and again in the fall, 600 pounds of fertilizer being the smallest amount used in any of his fields. This year he will spread the same amount of application over three periods.

Starting in April and running through September, Corey gets five to six feedings each season through pasture rotations. This is supplemented by grain feeding, at the rate of 1 pound to 6 pounds of milk. In 1952 he is reducing the ratio to 1 to 8 pounds of milk produced.

In his seeding program Corey had difficulties with narrow-leaf plantain. As a result, he is changing his methods so that the soil will be cultivated for at least 1 year before seeding. He plans to plant oats in the spring and follow with Sudangrass. Hay-seed mixtures or pasture mixtures will be planted the following spring. Corey noted that he

had the best catch, with the least amount of weeds, on a field that had been planted to potatoes for several years.

Operations at Whitehall are strictly a family affair. Mrs. Corey, also born in the Azores, keeps all the books. Manuel Corey, Jr., at 23, is herdsman and understudy for his dad. Other children, each active in helping make the farm successful, are Mary, 24; Alice, 16; Edward, 13. A nephew, Frank G. Sylvia, 2 years in this country from the Azores, is the only full-time farm helper.

Manuel V. Corey became king of New England's 1951 green-pasture builders in six States solely on his 87-acre operations at Whitehall. Additionally, he farms more than 60 acres under lease.

Two of the three All-New England prize winners, and 15 of the 18 first-, second-, and third-place State winners, are soil conservation district farmers.

Conservation farmers swept all three places in Vermont, Maine, Rhode Island, and New Hampshire. They won first and second honors in Massachusetts, and third place in Connecticut. Of Vermont's 42 prize winners, 38 are district farmers.

#### **EDWIN W. GOPLEN—CONSERVATIONIST.—**

At the 1951 Minnesota State Fair, Edwin W. Goplen, Zumbrota, Minn., farmer, and chairman of the board of supervisors of the South Goodhue Soil Conservation District, received a \$150 award from the Firestone Tire and Rubber Co. of Akron, Ohio. The award was in recognition of Goplen's efforts in promoting soil conservation through the use of an airplane.

Goplen got started in soil conservation in March 1935 on signing a cooperative agreement with the Zumbrota CCC camp calling for almost a complete rejuvenation of his 160-acre farm. Terraces were constructed, contour strips laid out, gullies healed by masonry structures. A 6-acre wood lot was planted to trees, and several smaller areas aggregating 3½ acres were improved for wildlife. Goplen's name since then has become synonymous with the conservation of soil and wildlife throughout Minnesota.

In 1936 Goplen was appointed to the board of the Zumbro Valley Soil Conservation Association, and in 1937 he was instrumental in getting the Minnesota Soil Conservation Districts Law passed by the legislature.

The South Goodhue Soil Conservation District was organized in September of 1942, and Goplen was one of the two supervisors appointed by the State Soil Conservation Committee to serve on the five-man board of supervisors. He still holds this office although it has become elective rather than appointive.





Edwin W. Goplin (right) accepts award from Kenneth C. Butler, president of Minnesota Flying Farmers.

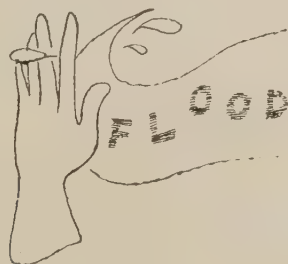
He was president of the Zumbrota Chapter of the Izaak Walton League of America for 2 years, and in 1948 was chosen as one of the four outstanding farmer-sportsmen in Minnesota who had accomplished the most for wildlife conservation during that year. In 1950 he was selected as chairman of the land-use committee at the State convention of the league and has influenced this body in no little way in its recognition of the importance of soil and water to wildlife conservation.

In 1949 the legislature added two farmers to the State Soil Conservation Committee and Edwin W. Goplin was unanimously selected as one of these members.

The rewards Goplin has received have served only as an added incentive to accept more responsibilities in the promotion of soil, water, and wildlife conservation.

—ROBERT ANDERSON

**WORK AT WATKINS GLEN.**—Through the work of the Schuyler County Soil Conservation District in coordinating the efforts of town, State, and Federal agencies, New York State's famed Watkins Glen at last will be protected from flood damage. The Soil Conservation Service is providing technical services for construction of a storage dam 14



feet high and 800 feet long. It is designed to hold back the water from a 2½-inch rainfall, such as caused tremendous damage in the Glen area last spring. At flood stage the water will cover 4 acres and have a depth of 12 feet. Normal size of the pond will be 1 acre, 3 feet deep. Flood waters will be released gradually through a 12-inch outlet.

**CHRISTMAS TREE SALES.**—District farmers in Michigan enjoyed estimated sales of 750,000 Christmas trees during the last yule season. Prices varied from 50 cents to \$1.50 per tree on the stump. Most of them were produced by district farmers in the counties of Grand Traverse, Mason, Muskegon, Ottawa, Kent, and Livingston.

## REVIEWS

**FUNDAMENTALS OF SOIL SCIENCE.** By C. E. Millar and L. M. Turk. Second Edition. 484 pp. Illustrated. 1951. New York: John Wiley and Sons. \$5.50.

Soil science has come a long way since Lawes and Gilbert laid out their plot experiments at Rothamsted in 1843. Several hundred research workers are seeking answers to questions about why our soils behave as they do. These workers use some of the methods of atomic physics; they make X-ray photographs; they juggle electrons; they use modern equipment for chemical analysis; and they

still use, along with these and other methods, the time-honored techniques of careful observation and precise description. Since soil science is truly a science, they also put together facts and ideas to give us improved concepts about the nature of this essential stuff. Their researches fill two specialized scientific journals in the United States, many technical bulletins, and hundreds of other scientific papers published all over the world. The writer of a textbook on soils draws from this mass of literature plus his experiences, and must choose his subject matter with care.

This book is the second edition of one that first appeared in 1943. The general outline is much like that of the first edition. A chapter of 33 pages on soil conservation has been added, and two short, specialized chapters on fruit soils and lawn soils have been omitted. The first three chapters of the earlier edition have been rearranged into five, and the entire text has been considerably revised and expanded. The result is a book that is valuable both to the college student who is beginning the study of soils and to the professional worker who studied soils some years ago and wants to brush up.

The book lives up to its title explicitly. It is an exposition of fundamentals, not a handbook of applied soil science. You find in it a good discussion of soil acidity, but no directions about how to make a particular pH test and decide how much lime to put on. The significance of the pH scale is explained, however; and all that is as it should be in a textbook of this kind. You find mention of the rapid diagnostic tests for nutrients in soils, but no information about specific tests and how to make them. That also is as it should be, for in college such subjects must be covered in advanced courses. The modest statement that interpretation of such tests is difficult and should be attempted only by experienced persons might well be memorized by soil conservationists and all who deal with farmers and gardeners.

Outstanding parts of the book are those dealing with soil organisms, organic matter, cover and green-manure crops, and farm manures. In some of the other chapters the explanations could be improved. A better concept of soils would be given, for example, by a little less emphasis on the separates of mechanical analysis and more on the concept of a continuous size-distribution curve as the usual occurrence; by a discussion of the energy

concept of soil moisture and the relation of moisture tension to the arbitrary divisions into gravitational, capillary, and hygroscopic water; and by some additional discussion of the variations that are tolerated, as well as the homogeneity that is required, within a soil-mapping unit such as a soil type. Some facts about different clay minerals would help us understand why some soils shrink more than others when they dry out, and why soils differ in such properties as erodibility and base exchange capacity.

Paper and typography are better than in the wartime edition of 1943. Readability is about what we would expect in a college text: Reasonably good, but could be improved in some places without damaging the subject matter. The book is not one that will keep you awake nights, but it is packed with sound information about soils. If you don't have one of the standard texts on soils in an edition printed within the last 10 years, you will find it well worth your while to take a good look at this one.

—J. G. STEELE.

**THE 4-H STORY.** By Franklin M. Reck. 294 pp. Illustrated. 1951. Ames, Iowa: The Iowa State College Press. \$3.

This is a history of 4-H Club work arranged for by a committee of the Cooperative Extension Service and published and distributed by the National Committee on Boys and Girls Club Work. The story covers a period of more than 40 years, recounting details of the youth phases of the Extension program, in which an estimated 15,000,000 boys and girls have taken part and in which some 2,000,000 are now enrolled annually.

Although much research was done in order to have accurate and complete information, there are admittedly many gaps which leave an opportunity for a more complete story eventually. One is impressed, however, by the fact that it is a most acceptable recording of the facts even though much of the activity occurred a long time ago. The old photographs are of particular interest.

There are chapters which describe the Corn Club dating back to 1904, the Canning Club to 1910, and the national advent of the clover-leaf emblem to 1911. Other interesting chapters are about the National Committee, the early days of the Club Congress, and the National Camp. The chapter





**National 4-H Club winners in 1951 soil and water conservation contest:** Harry Lee Strouth, Clintwood, Va.; John D. Bane, Burlington, W. Va.; Belden D. Patrick, Woodbine, Md.; Tommy D. Tate, Fairfax, Okla.; Larry L. Neibauer, Lohman, Mont.; Franklin E. Johnson, Valdosta, Ga.; Joseph A. Miller, Vernon, Vt. Kneeling by map—Wilbert K. Glynn, Wykoff, Minn.

"Livestock in the South; Conservation Everywhere" is one with special meaning to those primarily interested in Extension education in soil and water conservation. Boys and girls in large numbers (186,141 in 1950) are getting good information about land care from Extension workers and from volunteer leaders who know the merits of soil and water conservation.

It was a pleasure to receive a copy of this book presented by one of the donors to those attending the thirtieth National 4-H Club Congress in Chicago. Reek also is the author of "Manual for Local Leaders—4-H Soil and Water Conservation Program," which is being used widely in 4-H Club work.

—W. R. TASCHER

**THE CONSERVATION OF GROUND WATER.**  
By Harold E. Thomas. 327 pp. 1951. New York-Toronto-London: McGraw-Hill Book Co., Inc. \$5.

This book is a survey of the present ground-water situation in the United States, and describes the history and effects of ground-water use throughout the Nation. For engineers, geologists, hydrologists, and others concerned with ground-water supply problems, it provides a summary of available information on the development and use of ground water, and then discusses the experience of some 70 areas in 35 States.

The author of the book, Dr. Harold E. Thomas, is a geologist with the United States Geological Survey and has a wide experience in ground-water supply. The survey was sponsored by The Conservation Foundation, an independent, nonpolitical organization dedicated to the conservation of the earth's life-supporting resources. A committee, composed of Dr. Abel Wolman, of the Johns Hopkins University; Carl G. Paulsen and Dr. A. Nelson Sayre, of the United States Geological Survey; Homer M. Wells, of the United States Soil Conservation Service; and Edward N. Munns, of the United States Forest Service, advised the Foundation in this survey.

The information presented in the book is based upon published reports, unpublished data, and discussions with technical men in various Federal, State, and private agencies studying problems pertaining to ground water. Ground-water problems resulting from pumping, from settlement and use of the land, from irrigation and drainage operations, and disposal of wastes are analyzed. The book also outlines the need for more effective ground-water development and the requirements for better ground-water management in the United States. A series of maps shows the ground-water situation over the country, including areas of overdraft, salt-water intrusion, and other pertinent aspects.

Ground water is a natural resource upon which a large part of our population depends. It supplies many municipalities and is widely used in agriculture and industry. Thomas calls attention to our increasing requirements for water, current deficiencies and future needs for effective ground-water development, problems of water rights and of regulating ground water, and water-conservation practices. The last chapter of the book by Abel Wolman is devoted to better ground-water management. Excellent data are presented in the appendix on pumpage from 107 major ground-water reservoirs throughout the Nation.

This new book performs several valuable services. It will be an excellent addition to the libraries of those faced with problems of ground-water supply. The selected bibliography of areal ground-water studies given in the appendix should prove useful to research workers as well as practicing engineers.

—HARRY F. BLANEY

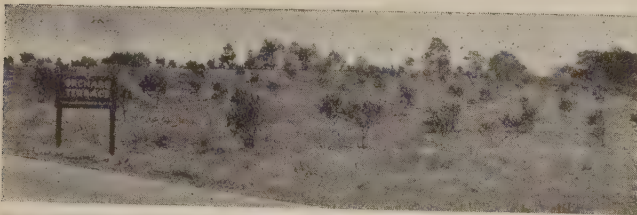




**TO BE NOTED IN PASSING.** — "The public should know that farmers are protecting our heritage in the soil," says Manager Bill Knuth of Firestone Farms, Columbiana, Ohio. Knuth has put up large, attractive signs calling attention to various practices.

It's a common complaint that "We don't see enough soil conservation work." Fast driving may be one reason, but Bill Knuth's signs are actually slowing down tourists on Ohio Routes 7 and 14.

Herman L. Reuter, Lisbon, Ohio, farm planner with the Columbiana Soil Conservation District, assisted with the Firestone conservation farm plan.



**DISTRICT CUTS INSURANCE COST.**—After 5 years' effort, the Allegany County (N. Y.) Soil Conservation District has contrived a 16 percent total saving amounting to \$205 annually in its outlay for compensation insurance. It is a result of getting a special classification set up to cover the time when district workmen are planting trees, and it cuts the cost of coverage during this operation by about 50 percent.

Previously the district paid at the rate of \$5.52 under a farm rating which covered the workmen as machinery operators. In tree planting the accident hazard is much lower, and for this type of employment the rate now has been cut to \$3.38 as "landscape gardening."

Under the new schedule, compensation rates paid by the district are: Grading of land (machine jobs), \$7.249 per \$100; surveying, \$0.782 per \$100; and landscape gardening (tree planting), \$3.525 per \$100. The district directors are particularly pleased because the cut in rate has been carried back by the State Insurance Fund to cover the 1950 and 1951 policy periods.

**A BETTER RISK.**—Supervisor John D. Fuqua of the Chipola River (Fla.) Soil Conservation District and Soil Conservation Aid Frank DeBord with the Gadsden Soil Conservation District are members of the State board of directors of the National Farm Credit Association. They showed slides at their Miami meeting and discussed the costs and benefits of improved pasture, pointing out the need for increasing the sum of money to be loaned to an individual for that purpose by the National Farm Loan Association. Fuqua proposed that the association make a ruling that any loan applicant must have either a complete soil and water conservation plan or sign an application for SCS assistance in making one before his loan could be approved. He brought out that carrying out a complete soil and water conservation plan would make the applicant a more sound risk, and that signing an application would be evidence of good intentions on the part of a new applicant and would insure continued improvement on the part of the borrower.

The Florida board of directors voted to have Supervisor Fuqua present the proposal at the national meeting of the directors of the National Farm Credit Association.





APRIL 1952

# Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE



# SOIL CONSERVATION •

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## WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, under approval (August 6, 1951) of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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**KEEPS 'EM ON TOES.**—Twelve hundred copies of SOIL CONSERVATION Magazine are sent to members every month by the Nebraska Conservation Foundation, Inc. "The information presented is considered the best available to keep the members up to date on conservation and to help maintain their enthusiasm for it."

**THE HAWK AND THE HEDGE.**—Seeing a hawk chase small birds around his multiflora rose hedge gave Jesse J. Denton, Jr., SCS aid at Flemington, N. J., a new respect for the hedge's conservation value.

Denton planted multiflora seedlings behind his house at Ringoes in 1946. By winter of 1950 they were 6 feet high and thick enough to keep farm animals from getting through. One cold day in January Denton noticed several birds huddled in it, twittering in

(Continued on page 201)



**FRONT COVER.**—This fine pond was built in 1949 as part of the complete soil and water conservation plan of the Ray Shook farm, Curllsville, Pa. The farm is in the Clarion County Soil Conservation District. Shook is a former director, and the first chairman, of the district. His plan includes contoured strips of corn, hay, and grain in rotation; diversions; sod waterways; reforestation. In swimming and skating seasons, this pond is a recreation center for Curllsville youngsters and their elders. It has one-third acre surface. It is fenced off; has seeded banks and a diving dock. This side of the contour strips in background may be seen some of Shook's fine dairy herd. Gordon S. Smith is the photographer.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



# SOUTHWEST GETS THIRSTIER AS WATER PROBLEM GROWS

By **ROBERT V. BOYLE**

**N**EVER before has water been so desperately needed in the Southwest. High prices have led to increased farm acreage and an expanded need for irrigation water. Heightened population of towns and cities has raised the water consumption and further complicated the situation. Military installations, drawn to the Southwest by climate and space advantages, together with quickened mining and other industrial activities, also have built up the demand for water.

Notwithstanding the growing need, water supplies have remained comparatively static. Indeed, in some of the Southwestern States—Arizona and New Mexico particularly—there has actually been a startling decrease in supply. The principal cause is the below-normal precipitation in the form of snow in the high mountains. For nine consecutive years now the runoff caught in the Roosevelt and San Carlos Reservoirs in Arizona has been short of



**It is easy to determine with a soil auger whether or not a field has been properly irrigated.**

normal, and in some other Southwestern States the reservoirs have been nearly as dry. Ground-water supplies are low in most areas because withdrawals far exceed natural recharge. Pumping from greater and greater depths has resulted from vastly improved pumping equipment and cheaper power, abetted by ever-rising income from crops. Sooner or later, the ground-water supply will be exhausted and it will be mandatory — if not by State law then by natural law — that use be pulled down to balance with the recharge rate.

Some additional water can be brought into water-deficit areas by costly diversion from the Colorado River. While this water has been allocated to the various States of this basin, it has not been fully appropriated and utilized. Agriculture will not get all additional water so provided; increased municipal, military, and industrial needs will take up much of the slack. In fact, municipal and industrial uses have already begun to cut into irrigation-water supplies, and this trend can be expected to become even more pronounced.

So where does that leave the irrigation farmer? Before examining his present position, it might be well to look at where he's been. What has he been accustomed to in the matter of water? There always have been occasional dry years — "short" years — of course. And there are some areas or projects which are always low on water; they never have had enough; they were overdeveloped in the first

Note.—The author is chief of operations, Soil Conservation Service, Albuquerque, N. Mex.



**Overirrigat'**

**le water run off field into borrow pit and even onto highway. Proper leveling, careful application, eliminates waste and increases production.**



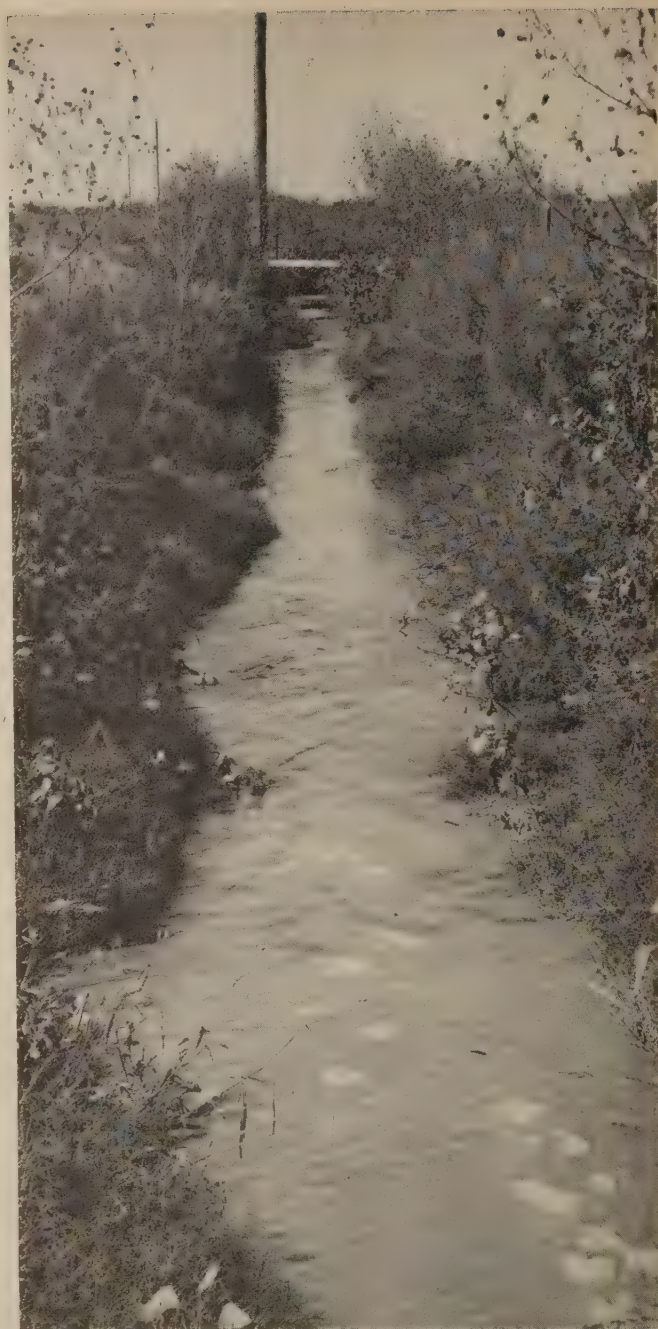
place — too much land subjugated for the water available. But in many places irrigation farmers have had what water they required. And if they often have been wasteful, they have been so unwittingly.

It is estimated that of the water diverted from streams for irrigation in the western United States, 3 out of 4 acre-feet are wasted. In other words, only 1 acre-foot out of 4 reaches the plant root and is used by plants. Efficiency is therefore about 25 percent. Possibly half of this loss is in transportation, in the canals and ditches between the diversion dam and the farm head gate. The other major waste has been simply through use of too much water on the farm. This has taken many different forms, for example: (1) Making a set in the evening and permitting water to run all night without further attention; (2) use of too small a head on light soils, thus making it necessary to run water a long time to reach the end of the row; (3) use of too big a head with excessive waste at the end of the row or border; (4) use of too long an irrigation run (length of row or border); (5) uneven fields — low places, high places — resulting in flooding the former while trying to irrigate the latter; (6) hiring inexperienced men to handle water.

What have been the results of these practices? Well, principally the upper ends of fields, borders, or rows were overirrigated. Water went down far below the root zone. And very often tail water was wasted from the lower part of the field. Overuse of water not only leached plant nutrients from the root zone but very often caused waterlogging of the land being irrigated or of lower-lying fields. How many times have you seen the lanes and roads flooded, at least the borrow pits? Too often, also, the overapplication of water on steep slopes resulted in erosion and loss of good topsoil.

Extravagant irrigation methods didn't pay off. In fact, they sometimes depressed yields. It's well known that in the lower valleys some of the best and largest cotton crops were raised when water was scarce. Now that water-short years are the rule rather than the exception, extravagant application of water is a luxury that farmers can hardly afford.

How can we avoid wasting water? Well, there's that canal, mentioned previously, which has a lot of seepage loss. If complete lining can't be financed,



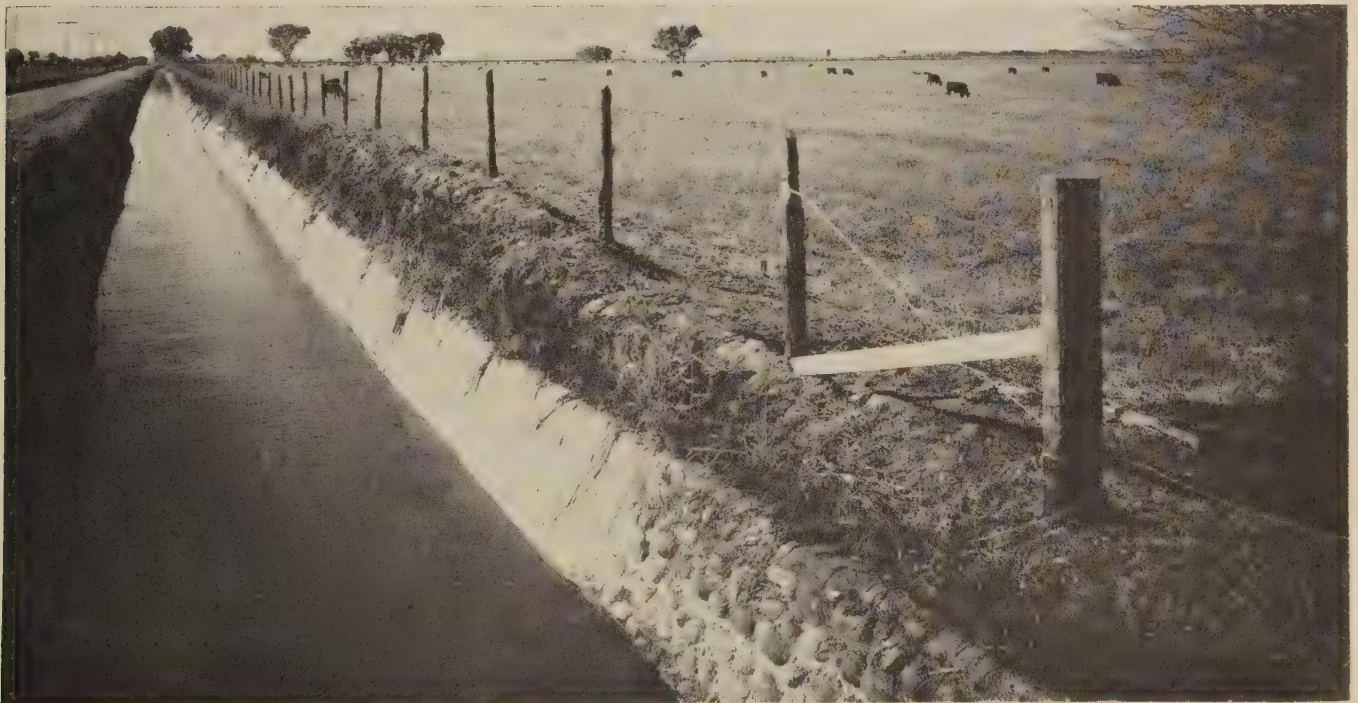
**Much water here is lost through seepage and through use by weeds before it gets to the field.**

then the worst places — the gravel pockets, for instance — should be located and sealed, and water-consuming willows should be cleared out of the entire ditch. On the distribution systems, the installation of measuring weirs should be considered. Many canal companies use the weirs and insure that each farmer or group of farmers gets a proper share of water. Some people think that water lost from canals is not wasted, because it recharges the underground flow of water. There





Arizona has suffered a protracted drought, with consequent shortage of irrigation water. The last time water flowed down the spillways of the Roosevelt Dam on Salt River was in the spring of 1941, when this picture was made.



Lining irrigation ditches helps conserve water. It reduces seepage, prevents pirating of water by weeds and other vegetative intruders.



is no doubt that some of the seepage water does return to the streams further down, but this fact is no comfort to the users who divert enough water into their canal but get only half as much as they need at their farm head gates. Also, a good share of the wasted water is permanently lost to the basin through evaporation and transpiration.

In the fields on the farms, there are a number of things that can be done—that are being done, more and more. Where water is scarce or costly, farm ditch linings should be considered, as well as turn-out structures, drops, and other structures. Ditches may need to be relocated with reference to a new field lay-out, which may involve change in direction and length of irrigation run. And, of course, most fields need leveling.

Now, all these things, when applied, still do not guarantee the best irrigation or a saving in water. They do make good and efficient irrigation possible, however. Here are some pointers which will insure best results:

1. Be sure that crops need water before irrigating. In other words, don't irrigate too often.

2. Don't try to run water so far that it penetrates much deeper at the beginning than at the end of the row; shorten the rows or borders, especially if soils are light.

3. Apply a big enough head to push water through in a hurry, if soils are light. An overnight storage pond may be required. And if soils are heavy, adjust the stream to small enough size to forestall loss at the lower end of field. Spiles or siphon tubes may come in handy for this.

4. Use a moisture probe or shovel to check the depth of penetration, while irrigating and afterward. Don't overirrigate. Shut the water off when the crop root zone has been soaked. Only enough water should be applied to fill up the soil storage reservoir. Experience with the moisture probe or shovel will show when penetration is about right.

Once in a while—probably in the spring when there is ample water from snow melt—it will be advisable to overirrigate in order to flush out accumulated salts. The best way to flush salts out of the root zone is not yet known, but one flushing irrigation a year ordinarily is enough. It should not be attempted where there is tight subsoil and the excess water cannot drain away readily.

Some of the larger irrigation districts employ engineers to give assistance to farmers in ditch



**This farmer uses siphons to take water from the supply ditch to the field.**

lining, field and ditch lay-out, and land leveling. County agricultural agents also are available for counsel on soil texture and certain related phases of irrigation. Financial help can be obtained from PMA's ACP on many of the practices mentioned. It is only in soil conservation districts, however, that the whole range of technical assistance can be had. These locally governed districts have asked for, and are receiving, the help of State and Federal conservation agencies. Soil Conservation Service technicians are probably most in evidence.

Specifically, the types of help that specialists can give a farmer include advice on soils, either in ditches or fields, and soil and water relationships; on whether or not ditches need lining, and if so, what to use and how much it will cost; on the best kind of permanent ditch and field lay-out—staking for turn-out structures, grade, and field leveling; on water management, which involves the frequency of irrigations, the size of head, the period of irrigation, and how to check on irrigation. First importance is attached to kinds of soil, slope of land, kind of crop, and many other factors. Technicians base their recommendations on research findings, and if a group of farmers wishes, it may arrange for a practical irrigation trial. You'd be surprised at some of the things that are learned during such a trial.

Now, why is all this technical assistance available to farmers in soil conservation districts? Why are Federal agencies assigning trained men to districts? It isn't to help the farmer only. Rather, it is because soil and water conservation is of concern

*(Continued on page 201)*





Scenes like this at Elephant Butte Dam on the Rio Grande haven't been known since 1942, when 4,000 second-feet of water was flowing over the spillway. Continued drought caused water to reach an all-time low in summer of 1951. A record snow pack on Cumbres Pass is bringing hope to valley farmers that the reservoir again may be filled this spring.



Growing population, increased farm acreage, other factors, create greater need for irrigation water. Yet, there is no increase in supply. Only solution appears to be improved efficiency in use of such water as is available. Land leveling, as seen here, is prerequisite to good irrigation; it also increases yields, saves time and labor.





## DISTRICT PROFILE

MARVIN MELTON  
of  
ARKANSAS

**Melton loads visual aids into plane before taking off for speaking engagement.**

Marvin Melton, of Jonesboro, Ark., is a businessman who likes to farm, fly, and talk soil conservation. He does all three with boundless zest.

Loaded with visual aids to support his talks, Melton flies his own plane to speaking engagements in all parts of Arkansas and in other States too. In Winnipeg, Canada, he told the International Association of Equipment Dealers how they might help to advance soil conservation. He has appeared before groups of implement dealers, bankers, businessmen, beekeepers, farmers, and others in Amarillo, Fargo, New Orleans, Peoria, and Cincinnati.

"I get a lot of personal satisfaction out of giving these talks on conservation," Melton says. "It gives me a good feeling to think that I may be helping to save this land of ours and put it in shape for permanent and maximum production. Aside from direct military security, I know of nothing that's more important for the Nation."

Melton doesn't let lack of airfields handicap him in his flights around the State. Recently he was to

address the Young Businessmen's Club at Piggott, where there are no landing facilities. So he landed at Kennett, across the line in Missouri, and officers of the club motored him the 12 miles to his destination.

Melton is much in demand throughout Arkansas. He averages 15 flights a year to make speeches. His talks, while varied to fit local conditions, are generally centered around the fact that conservation farming pays, and pays quickly. He cites figures showing that Arkansas counties where conservation farming is the general rule have increased per capita income over those lagging behind in conservation.

Among Melton's visual aids are 4-foot soil profiles. By large photographs, he depicts damage from erosion, and illustrates the advantages of pastures and cover crops. He chooses his visual aids with care to make them apply to local conditions. And he takes special pains to obtain local information for his talks.

Melton speaks from experience as well as observation. He and his two brothers, Oscar and W. O., are farmers and implement dealers in Jonesboro. Senior member of the firm, Marvin is in charge of the farming interests while his brothers run the implement business. All three are graduates of the University of Arkansas.

In 1944 the Meltons bought an eroded, run-down, 300-acre farm on Crowley Ridge for \$16,000. They immediately applied to their Central Crowley Ridge Soil Conservation District for help. W. L. Wilhite, Soil Conservation Service technician in charge of the Jonesboro field headquarters, and his staff were assigned to work with the Meltons in planning and applying a coordinated conservation program for the farm. The Meltons have been district cooperators ever since.

The three brothers did such an excellent job of building up the old farm through their conservation program that in 3 years they were able to sell it for \$26,000.

Another year, and they repeated themselves. The Meltons in 1948 bought another eroded, down-at-the-heels ridge farm. On its 260 acres they have done such a good conservation job that production already has paid for the intensive practices required; not only that, but the *value of the farm has been doubled.*



The Meltons are well on their way toward a year-round system of grazing for their fine Hereford cattle. They have excellent fields of Bermuda-grass, Kobe and Korean lespedeza, and white clover for permanent summer pasture, and tall fescue and Ladino clover for permanent winter pasture. Supplemental summer pasture consists of sericea lespedeza, sweet Sudangrass, and annual lespedeza. Ryegrass, crimson clover, button clover, and small grain make up their supplemental winter pastures. Fertilizers are applied every year in accordance with soil analyses.

In addition to their beef production in 1951, the Meltons harvested 18,000 pounds of crimson clover seed, 3,000 pounds of ryegrass seed, 3,000 pounds of tall fescue seed, and 4,000 pounds of sericea lespedeza seed. In 1950 they harvested 12,000 pounds of crimson clover seed which they sold for \$6,000.

The Meltons have done such an outstanding job of building up production through their conservation program that numerous tours of the farm are made every year. Claude Catheart, farmer and PMA county committee chairman, says: "Every time I pass the Melton farm I am reminded of what can be done to this seemingly unproductive Crowley Ridge land through conservation."

The brothers bought still a third hill farm last year; this one, 400 acres. It, too, is getting the conservation treatment. These farming operations are keeping Marvin busy. But not so busy that he can't indulge in his hobby of flying around the country to give talks on the need for and profit from soil conservation.

—A. J. TROXELL.

## SOUTHWEST GETS THIRSTIER

(Continued from page 198)

to the general public—to everyone—and vital to the national welfare.

In the Southwest, water conservation is soil conservation, and vice versa. Where rainfall is scant, soil without irrigation is of little or no value for farming. Therefore, soil and water are inseparable, and conservation of both simultaneously is imperative. In short, if civilization as we know it is to survive in the Southwest, it's going to be necessary to increase the efficiency of our use of water. Overall irrigation efficiency, as pointed out previously,

is now about 25 percent. If, by applying water conservation practices, the over-all efficiency could be increased to 50 percent, additional water would be provided the irrigated farms of the West more than equal that expected from all the storage reservoirs now being planned.

## THE HAWK AND THE HEDGE

(Continued from page 194)

great excitement. A hawk was circling low overhead. As Denton watched, the predator "buzzed" the bushes several times, but the little fellows stayed put.

Evidently angered, the hawk finally tried to crash-land in the hedge. The thicket and thorns halted his plans and forced him to the ground. After walking up and down disgustedly, he flew away, leaving his quarry still well protected by their refuge.



**SEE HERE!**—Supervisors of the Greene County-Crowley Ridge (Ark.) Soil Conservation District want everyone to know when they're in the district. They have erected clear, easy-to-read signs at the district's boundaries on all roads and highways.

**GOOD FARMERS KEEP INFORMED.**—A co-operator's sign and a year's subscription to SOIL CONSERVATION Magazine are being given to each cooperator in the Macon County (Ill.) Soil Conservation District who made a contribution toward funds needed to operate the district.

The White County (Ill.) Soil Conservation District directors have given a subscription to SOIL CONSERVATION Magazine to each of the high schools in the district.

# HOW COSTA RICA LEARNED ABOUT CONSERVATION



These contour tobacco beds were built entirely with a shovel, and are cultivated with a shovel and machete.

By CHARLES W. CLEARY

**W**HEN you reach the top of the divide you can look across Palmares Valley and see it rolled out like a picture with the church towers rising above the trees in the center.

The people who live in the valley make their living from the soil; and the children expect to make their living the same way when they grow up.

From the top of the divide, the valley looks similar to those in the rolling hills of Georgia or southern Tennessee. But this valley is different. It is different because it is on the route of the Pan-American Highway on the northwestern end of the Meseta Central in Costa Rica, Central America.

The Pan-American Highway is nearly finished now and the children will someday play games by counting States of the U.S.A. on the license plates of cars that come through the little town of Palmares on their way to the capital city of San Jose.

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Note.—The author is assistant State conservationist in Nevada. He is one of a number of Soil Conservation Service technicians who have taken time out from their jobs at home to help people in foreign countries learn about the United States methods of soil and water conservation. Cleary served in Costa Rica in 1949-50 as soil conservationist on the staff of the Institute of Inter-American Affairs.



Backbone of Costa Rican transportation system: a typical, gaily decorated oxcart used by farmers to move their produce to market.

This valley supports 10,000 people whose staff of life is tobacco. Farms are small. Most of them are operated by the owner and his family with the help of a few peons. Oxen plow the land. The machete and the shovel are the farmer's standard tools. Food crops are short. Rice and beans, the staple foods of Costa Rica, are brought in and the farmers buy them with money received from tobacco. There are not enough vegetables. The once fertile soil has eroded until many tobacco fields are cut by gullies that must be filled every planting season. Raw gray subsoil is in evidence everywhere. Tobacco fields run far up the steep slopes that rim the valley. The farmers have pushed as far as possible looking for new soil—soil that will produce a crop without the chemical fertilizers that have been brought into the valley in increasing amounts in recent years. Forest products are getting scarce. Some of the wood that is burned in the kitchen stoves is hauled from outside the valley. There is not much livestock except the oxen that pull the plows and the oxcarts, because there is not much livestock feed. Meat, milk, and eggs are short items in the local diet.

Here and there in the valley are indications that something new is taking place. Not infrequently there is a tobacco field with the beds running on contour lines. A few fields have hillside ditches across the face of the slope. These carry excess runoff into the stream beds as clear water, leaving the soil in the field where it belongs.

For years no one had been able to grow tomatoes in Palmares Valley. Each season someone would try a few but fungus diseases would strike the tomatoes down before they were ripe. Last year one farmer came home equipped with a small garden sprayer and a few pounds of Bordeaux mixture and planted about half an acre of tomatoes. Tomatoes are very expensive in Costa Rica during



the rainy season when the fungus diseases are worst. This farmer harvested tomatoes from his half acre all during the rainy season. When he checked his records, he found that he had sold enough tomatoes to bring 3,200 colones, or about 400 American dollars.

The corn and tobacco crops are planted, weeded, cultivated, and hilled with the machete and the shovel. To us who are accustomed to tractors and machinery that enable a single operator to handle many acres of planting, weeding, or cultivating in a day, the cost of producing a crop of corn or tobacco in terms of human labor is almost incredible, and it is small wonder that the farms must be small. An acre of tobacco will cost from 50 to 100 man-days of work.

The typical Palmares Valley farmer has a good dependable little horse. But, until very recently, he only used it to ride into town. Now, with just a little help, he has learned how to train his horse to work in harness with a walking cultivator, seeder, or middlebuster. His corn and tobacco crops are planted in contour rows between channel-type terraces and he is cultivating and weeding with the horse. Neighbors watched at first with skepticism and later with mounting interest. The farmer is wondering about getting a little more land. His horse and harness and cultivator opened a new world that had been closed to him before. Yet when I watched him one day, I wondered why such a little thing could mean so much. All that had been necessary was for someone who knew how to do it to come to Palmares Valley for a few hours to help him harness and work his horse.

Farther down the road is a little dairy. It wasn't much of a dairy till a year ago. The cows were potentially fairly good producers with a percentage of good Holstein blood. The trouble was that during the dry season they had very little to eat. The pastures dried up and milk production dropped to almost nothing. In addition, the cattle were plagued with torsalo (cattle grubs) in the wet season and with ticks in the dry season to the point that they were incapable of good production. Last year, with just a little help, the dairyman built a silo and raised a crop of sorghum and corn for silage and started weekly applications of insecticide for torsalo and tick control. Now the dairy produces the year round, the dairyman is prospering, and the people of Palmares have a dependable source of milk.

The Institute of Inter-American Affairs is an organization charged with the task of bringing some of the technical information developed in the United States to Central and South America. The organization has three divisions, Education, Health and Sanitation, and Food Production.

On the basis of a request from the Costa Rican Government the Food Production Division is operating now in Costa Rica. A field party from the Institute and the Costa Rican Government, working together, have formed the Servicio Tecnico Inter-Americano de Cooperacion Agricola known country-wide as STICA. STICA is an agricultural service organization with agents in the important agricultural areas of Costa Rica. The agents are young Costa Ricans, most of them graduates of Costa Rica's school of agriculture. The field party of the Institute, which includes the chief of party, who is also director of STICA, several technicians, and a business manager, brings knowledge and experience from United States agriculture and helps the young Costa Ricans apply it in their country. The program is one of fundamental agricultural needs. Throughout Costa Rica the emphasis is on four major considerations:

1. Conservation and better use of soil and water resources.
2. Control of plant and livestock pests and diseases.
3. Development of the use of agricultural machinery.
4. Development of crops to supply oil, fiber, and livestock concentrates.

Sound soil and water conservation practices constitute the basis of the agricultural development work and STICA workers throughout the country are conscious that any permanent improvement in Costa Rican agriculture must be built on a program that will improve and maintain soil resources.

This may well be due to the fact that the Soil Conservation Service has contributed substantially both in technical information and in personnel to the Food Production Division of the institute. Dillon S. Myer, former assistant chief of the Soil Conservation Service, served for some years as president of the Institute of Inter-American Affairs, and Rey Hill, currently assistant chief of the Food Production Division of the institute, went from the Soil Conservation Service to initiate field work of the Food Production Division in Central

America. Throughout the field work of the Food Production Division are techniques and methods tried out in soil conservation districts in the United States and brought by these men and many others who have gone from the Soil Conservation Service for longer or shorter periods for field assignments in Latin America.

In Palmares, as in many other small towns in Costa Rica, you will find a small office with a yellow and black sign proclaiming—Ministerio de Agricultura e Industrias—STICA—in bold letters. Inside the office you will usually find an earnest young Costa Rican with faith in the future of his country's agriculture and a pride in the organization of which he is a part. At Palmares you will find Carlos Luis Norza, if you come early in the morning before Carlos has gone out to the field.

Don Claudio Volio is Costa Rica's Minister of Agriculture. He is a graduate of a United States agricultural college, and during his college work in the United States he developed a special interest in watershed programs and in the logic of pursuing agricultural improvement work on a watershed basis. Early in 1950 Don Claudio organized a small committee with members from STICA and from the research staff of the Ministry and from the Inter-American Institute of Agricultural Sciences at Turrialba to make a study and develop a program for the improvement of the Palmares Valley which would involve both the application of available information and research work. The committee members first developed an outline of the major problems and needs of the agriculture of the valley and, with this outline as a basis, planned the necessary program to solve these problems. The items of the program were then considered individually and placed in two categories: (a) Those items on which sufficient information already existed to make field work immediately possible, (b) those items on which trials and experimental work must be undertaken before field work would be feasible.

The program as developed is relatively simple and unpretentious—necessarily so because of limitations of personnel and finance. Norza is going forward with his extension work, watching all the while the field trials which are under way on two small experimental farms rented by the Ministry's research agronomist. When the field trials produce enough information for Norza to use in his farm program, he will be there to take it and apply it.

Claudio Volio has a tremendous interest in the work in Palmares Valley because he must have the support of Costa Rican farmers, and he knows that there is no better way to win public support than with a demonstration of rapid progress in a well-known heavily populated area.

The Institute of Inter-American Affairs is vitally interested in the Palmares Valley because it promises to be an excellent demonstration of what an agricultural program can accomplish when backed by the best of cooperative effort.

The Inter-American Institute of Agricultural Sciences, which is the Latin American agricultural research and educational field station for the Pan American Union, is interested in the Palmares Valley because it promises to be a demonstration of what the results of their research program can do when utilized in a well-planned action program.

Norza, in addition to his regular program, is working whenever he has time on a land-capability survey of the valley. He has three distinct types of soils to work with. Each of these major soil divisions is further subdivided according to topography, and within these subdivisions is a further break-down according to climate, as determined by elevation, which affects crop adaptation. When this job is done Norza will have all his land classes delineated, with a summary of adapted crops and crop rotation and necessary soil conservation practices for each class.

When you make that trip down the Pan-American Highway in 1960, watch for the Palmares Valley. It is going to look different then.

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**REMARKABLE GAINS IN 2 YEARS.**—In fields where erosion had slashed gullies 6 inches to 2 feet deep, with great ensuing losses of fertilizer, lime, and seed, John Kimble, West Nottingham farmer in Chester County, Pa., in 2 years increased his tomato yield 100 percent per acre, his oats production 50 percent per acre, and his corn crop 15 bushels per acre.

Contour farming reduced by one-third the time required to handle field work. By operating his equipment on the level, he cut his fuel bill 40 percent; he can do a lot of work in third gear with a three-bottom plow.

Kimble started putting conservation on his land in the spring of 1950. He now has 56 acres in contour strips. Gullies have been sloped and seeded to make 2,250 feet of sod waterways. In the dry years of 1950 and 1951 Kimble noticed that alternate strips of row crops and sod retained moisture.



# "TURNIP KING" KEEPS BUILDING SOIL



By HENRY G. SAUSELEN, Jr.

These carrots ran 12 tons to the acre. The team that produced them: Aubrey Watson, Henry G. Sauselen, Jr., and Melvin Watson.

AUBREY WATSON, famed "Turnip King" and intensive truck farmer embraced conservation under duress — 2 years of heavy soil losses by preventable erosion.

In 1939 a roaring north wind swept across his farm in Gloucester County, N. J. It lasted 2 days. It carried away tons of topsoil, and literally blew sweetpotatoes and onions right out of the ground. The next year a severe rainstorm washed away still more topsoil, and in his cropland slashed gullies big enough to bury a tractor.

"We were fast having less and less than the 88 acres recorded in the deed," says Watson.

He had to take quick combative measures, or quit farming altogether. He sent an SOS to all the agricultural agencies in the county. In response the South Jersey Soil Conservation District sent Leo Nocenti, an SCS technician working coopera-

tively with the district, to look into the worrisome situation.

It took a lot of studying, planning, footwork, and cooperation — but the damage could, and would, be repaired; the disappearance of soil fertility could be stopped and its values restored for top production. A complete conservation plan was required. It would include contour strip cropping and crop rotations. The change would take time, but it could be handled with the use of the Watson farm equipment and would require no extra cash outlay.

With an eye to the time when he hoped to retire from active ownership and operation of the farm, Aubrey Watson turned the job of working with the district and the SCS technicians over to his son Melvin. During the next 2 years, with no more cash outlay than would have been required under old-style operations, the complete conservation plan was established. And in 1949, just as Aubrey had

Note.—The author is work unit leader, Soil Conservation Service, Woodbury, N. J.



**Air view of Melvin Watson farm. The light strips had just been seeded to turnips for spring production; onions grew there much earlier. The medium light strips were in alfalfa. The dark bands were carrots.**

foreseen, Melvin took over as owner and operator with a well-rounded background of experience in farming "on the level."

When spring came in 1951, County Agent George Lamb arranged a field-day demonstration at the farm so that others could see just what had been accomplished under conservation. Broadly smiling Melvin and his happy dad greeted the visitors. Erosion had stopped almost as soon as the soil-protective measures were established, Melvin told them, but it was 3 years before he began to notice sustained improvement in yields or an improved condition of soil. "Years of ravishing are not overcome in a jiffy," he ruefully noted.

Melvin Watson kept careful records. He is getting 300 to 500 bushels of turnips per acre in fields where only 250 bushels were produced 10 years ago. At current prices, that is a gain in income of \$525 to \$875 per acre.

The increased production enables Melvin to market 6,500 bushels of turnips annually at Cleveland, Pittsburgh, Baltimore, and Washington. Half is from his farm; the remainder by purchase from other growers. He is keeping the "Turnip King" crown in the family.

In carrots, a new crop at the farm, the yield is among the highest delivered to the canning company. It is about 3 or 4 tons per acre more than the average production by others, even in a dry season. The local average is about 9 tons per acre, but Melvin is digging 12. At current prices, this is equal to about \$60 to \$80 more revenue per acre.

All of Melvin's cropland is in contour strips. Alfalfa and vegetables are in alternating strips.

After carrots, onions, and turnips are harvested, there is a good cover crop on the land to guard against erosion. The alfalfa hay — 4 to 5 tons per acre now, as against only 2 tons per acre 10 years ago — is sold to a nearby dairyman. At current prices it means a gain of \$90 to \$135 income per acre.

Last year Melvin had 25 acres of carrots, 15 of onions, 10 of radishes, 7 of spring turnips, 5 of pumpkins, and 18 of alfalfa. There are 3 acres in the farm wood lot. Under the woodland improvement program in Watkins' complete conservation plan, Glenn Smith, SCS technician, has marked 43 trees for selective cutting. These black and white oak and tulip poplar trees will produce 15,620 board feet of lumber, log rule. Fifteen years after this cutting is made, the tract, permanently in woods, will be ready to yield another selective crop.

Melvin uses 5 acres as range for turkeys. Aubrey started this side line with 50 birds before he became a conservation farmer. With the aid of his contour strips, Melvin has increased the annual carrying capacity to 2,000 turkeys. He raised 1,200 in 1951.

The soil of the Watson farm now has improved moisture-holding capacity. Land that formerly could not be worked until late in spring now benefits from better drainage. Plowing and planting once were held up by wet spots in square fields. Now, each spring, Melvin starts at the topmost strip and progressively works over his fields to the lower parts, without loss of time. "It's better to farm curved rows than to haul dirt to fill gullies, and we've done both. Sure, it took a little extra



time and care at the start, but now we wouldn't farm without contour strips," say the Watsons.

Control of erosion and improved water-holding capacity were emphasized at the farm in 1951. With rainfall well below normal, Melvin still had bumper yields of carrots, onions, and turnips of high quality; other farmers not in conservation farming had lessened yields and poorer quality. Part of his good results, Melvin says, were properly attributable to improved moisture-holding capacity, and part to lime, fertilizer, and improved seed varieties. Lime and fertilizer get in their goodicks because they are not washed away before they can get their job done, Melvin explains.

Annual soil tests determine the kind and amount of fertilizer and lime needed in each field. Every year they reveal that the organic content is mounting higher and higher.

"It's fun to work with this soil now," Melvin remarks. "If Dad hadn't got us turned around and

started in the right direction, we just wouldn't be farming here now, because the rains and winds would have washed and blown the place away."

Melvin keeps improving his operations. This season, for example, he bought a two-bottom roll-over plow that is ideal for work in contour strips. It helps improve moisture-holding capacities by throwing all furrows one way. This eliminates the low-producing dead furrow that is often such a problem.

The example set by the Watsons and the outstanding results that they have obtained from conservation farming have not escaped the notice of other farmers. Many in Gloucester County have followed their lead. There's Robert Hemphill, for example. Hemphill, whose vegetable farm slopes were short, steep, and considerably eroded, asked the district for a complete conservation plan tailored to his acres and operations, on the basis of over-the-fence observations of his neighbor's farm.

## CONTOURING PERMITS QUALITY CROPS

By HUGH F. EAMES

**C**ONTOURING has proved its value on 20 formerly depreciating acres farmed by Burdette Farnham near East Hartford, Conn.

The land once was continuously in tobacco. It had been cropped steadily for well over half a century. It was losing organic content steadily notwithstanding the disking-in of cover crops.

In an effort to add needed organic matter, Farnham tried to make use of peat (testing 85 percent organic matter) from his nearby bog. But the power shovel became mired and had to be hauled out.

In 1938's "big hurricane" days, this field, in fact most of the farm, was under the floodwaters of the Connecticut River. Farnham had read a lot about conservation farming and was keenly interested in the possibility of contouring. A few years ago, without the help of any agency, he laid out contour



**Burdette Farnham cultivating tomatoes in 20-acre contoured field.**

lines on the 20 acres and began to farm horizontally. Now he wouldn't farm any other way.

The soil is so "early" that Farnham usually starts working it in March, or early April at the latest. He has his vegetables on the market before most farmers in that area think about harvesting.

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Note.—The author is with the current information division, Soil Conservation Service, Upper Darby, Pa.

He grows 3 acres of tomatoes, and 17 acres of celery, cauliflower, cabbage, iceberg lettuce, peppers, and eggplant. Because the acreage is limited, he aims for high quality, specializing in fancy products that bring top prices.

An incredible amount of labor is involved, but it pays off. Take contoured tomatoes, for example: Staking the rows and building the wire and twine trellises require a lot of labor, but the twice-a-week cultivation and spraying are done much easier and at less cost; there is less spoilage and more yield.

When picking starts in July there may be only 2 or 3 baskets harvested daily. Through the entire season, however, the average daily harvest will be about 100 baskets. Last year 7,000 half-bushel baskets of tomatoes were produced on the 3 acres. At the peak 450 baskets per day are harvested. Farnham picks the fruit until the prices get down to about \$1.50 per basket. Then he invites outsiders to bring their containers and pick what they want for 50 cents per basket. This works out well, except that the rush of pickers causes traffic problems.

The old deep gullies have disappeared from this field. Contouring keeps soil and fertilizer in place and lets the soil soak up and store excess rainfall for later use. Contour rows permit Farnham to irrigate steadily for 1 hour. This supplies enough

water for one application, and every drop of it sinks into the soil.

If the rows ran up and down the hill, after about 15 minutes of application the water would be running off the field, before the soil had received the water that it needed. Then Farnham would have to stop for about 15 minutes before he could irrigate again. It would be a continuous process like this unless he moved the pipes more often. By either of these methods, both water and labor would be wasted.

Farnham removes the tomato trellises at the end of each season and puts them back at the start of the next — always on contour. Of course, building the trellises in straight rows would be easier, but experience has proved to him that this is not the way to handle sloping land. In contour operations, this farmer points out, use of equipment is not difficult. He uses a small tractor for cultivating and spraying, and larger equipment for plowing and harrowing.

"Few other contour operations are so complicated as staked and trellised tomatoes," Farnham notes. "But I have found that contouring pays, and I like it. Any other farmer with a similar set-up can get the same excellent results."

# COUNTY FARM PROSPERS UNDER CONSERVATION

By JERRY KREIGER

**T**HE old title of "poor farm" doesn't apply in Berrien County, Mich., any more.

Under a soil conservation plan started on the farm 2 years ago, the county farm has changed from a red-ink proposition to a profit maker.

Where 1 ton to 1½ tons of hay, and 40 or 50 bushels of corn, came off an acre before the plan was started, now 2½ tons of first-cutting hay and nearly 100 bushels of corn are the yields.

From a problem of buying 3,000 bushels of corn and 50 tons of hay from the outside each year to

carry, roughly, 75 head of beef and dairy cattle, the farm will produce more than enough hay and corn for over 100 head of cattle this year. It also will supply all the feed for 150 hogs.

The county taxpayers won't have to buy any meat from the outside to fill the meat needs at the county hospital and infirmary this year. And the number of patients is now greater than it has ever been before.

Except for potatoes and a few specialty diet items such as head lettuce, the county farm will provide all the beef, pork, milk, butter, eggs, poultry, and summer vegetables required for the hospi-

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Note.—The author is farm editor, *The News Palladium*, Benton Harbor, Mich.





Dairy herd in Sudan pasture.

tal and infirmary. And as quickly as the soil is built up enough through a program of fertilizing, liming, and legume crops, the farm will also keep the potato bins filled.

Last year, only the second year of the program, the farm showed a net profit of \$9,000, after depreciation and all other charges were deducted. Produce from the farm is "sold" to the hospital and infirmary, and prevailing market rates figured to show the farm's earnings.

Before the soil conservation grassland farming program was started, the farm was doing well if it broke even, according to Harry Hogue, Eau Claire, a member of the Berrien County Welfare Board, which supervises the farm.

About 3 years ago the board decided something drastic had to be done to put the farm back on its feet. Its soil had been "mined" so long that alfalfa wouldn't grow anywhere on it, and on some places clover wouldn't even grow. Its Junegrass pastures wouldn't carry the livestock to the middle of summer and its grain yields wouldn't last to winter.

The board called in for advice James E. McKittrick of the Soil Conservation Service, cooperating with the St. Joe River Soil Conservation District, and County Agent J. D. Johnson.

The result was a complete soil conservation farm program for all 433 acres.

Gail Peapples, a progressive young farmer, was brought in as farm manager. Following the plan strictly, Peapples has brought about a complete transformation.

He has poured some 450 tons of lime into the soil in 3 years, and he has been liberal with the fertilizer. This year he's used 44 tons of commercial fertilizer, in addition to some 500 tons of manure produced on the farm.

There are no more Junegrass pastures. The stock grazes on lush stands of alfalfa-bromegrass and clover, plus some Sudangrass for temporary pasture.

Under the soil plan, the level land is in a 4-year rotation of corn, oats, clover, and wheat. The rougher and hilly land is in a 6-year rotation of corn, oats, and 4 years of alfalfa-brome. All grain crops are seeded with legume cover crops. The farm, which actually is divided into two separate tracts about 5 miles apart, is about equally divided between level and rough land.

Despite the big transformation of the farm, Peapples notes that this is only the third year and that even more improvement lies ahead.



Rescuegrass ready to be combined for seed at soil conservation nursery, Chapel Hill, N. C.

## RESCUEGRASS FOR THE SOUTHEAST

By B. H. HENDRICKSON

OVER a century ago, a Mr. Iverson of Columbus, Ga., tried to interest other Georgians in a grass that he named rescue, because it started growth in the fall after summer grasses became tough and wiry. In his pasture rescuegrass provided some winter grazing, went to seed in late spring, reseeded itself, and maintained itself.

That was long before the day of commercial fertilizer. And since this grass likes good land, and will not grow well on poor soil, Iverson's efforts brought little or no response. The grass never became popular, and it seems to have been forgotten or overlooked for about 100 years. The scientific name for rescuegrass—a brome—is *Bromus catharticus*.

About 10 years ago, the Soil Conservation Service made observational plantings of this grass at some of its nurseries. The plants were well fertilized. Results were so outstanding that seed was

harvested and distributed to soil conservation districts for observational plantings on farms. Here the grass was confronted by a variety of conditions. Several farmers sowed seed on kudzu in the fall. Results were good.

In the fall of 1948, we planted rescuegrass on old stands of kudzu that were grazed down in the fall. We got only a thin stand the first year, but the grass thickened to a full stand the second fall. It was about 6 inches high and ready to be grazed by the first of November.

Since then we have had both kudzu and rescuegrass for grazing from July through October. Many of the old rescuegrass plants lived through the summer in the partial shade of the kudzu. From November until mid-April we had rescuegrass grazing while kudzu was dormant. We closed the pasture from mid-April to about the middle of the summer to let the kudzu stand recover.

We still need a lot of information about this plant combination. We already know that the grass, which is a short-lived perennial in north Georgia and usually a reseeding annual in the

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Note.—The author is project supervisor, Southern Piedmont Conservation Experiment Station, Soil Conservation Service, Watkinsville, Ga.



Coastal Plain, will survive in a stand of kudzu that is grazed in the fall. We know that rescuegrass is palatable and that stock like it. And like the other brome-grasses, it is nutritious.

We still lack sufficient knowledge on how to manage kudzu in combination with rescuegrass, and on what fertilizer treatment to use and when to apply it. It is common practice to fertilize in the fall to stimulate the growth of winter grass. Grass that grows in winter draws rather heavily on mineral nutrients that are essential to the satisfactory growth of kudzu. Will liberal fall applications of fertilizer take care of the needs of both cool-season grass and warm-season legume? Or must we fertilize in the spring for the legume?

We also need to know more about grazing management. The vigorous growth of grass that we've been getting in the winter was due to the effect of the kudzu. We don't want to graze the kudzu out and thus effect a double damage.

Our experience shows that this definitely is not a year-round pasture. Where we grazed kudzu in the spring or overgrazed it in the summer, ragweed came in and required summer mowing. It is possible that more liberal fertilization would have increased the vigor of kudzu plants to such an extent that grazing would have been less damaging. We are planning further study of the management of these two plants.

Rescuegrass grows with other plants than kudzu. It has grown in combination with sericea in much the same way as with kudzu. It has grown in mixtures with reseeding crimson clover and other annual winter legumes. And it has grown successfully with alfalfa and Ladino clover.

What is rescuegrass like? It grows in tufts and is leafy at the base. It looks a good deal like oats. It grows 2 to 3 feet tall and has slender seed stalks that often bend down under the weight of the seeds. Seed heads resemble oats, except that they have a flattened appearance. Seeds are nearly as large as oats, but weigh only about half as much per bushel. The grass is a heavy seed producer, and in 1951 we harvested two seed crops on the same land—the first late in May and the second in July.

Mildew and smut are the most common diseases, and they are serious on most strains. The strain from Soil Conservation Service nurseries has been



**Rescuegrass with clover.**

one of the better kinds at Watkinsville. It certainly was one of those most nearly free from disease.

Rescuegrass may be sown on kudzu in the fall and pushed into the soil by the feet of grazing animals. It can be established in this manner even on rough, gullied land. About 25 pounds of seed per acre has given good stands. Somewhat lighter rates are sometimes sown on kudzu by farmers to get enough plants the first year for a light seed crop from which a thick volunteer stand comes the following fall. When seed becomes more plentiful, the heavier rate of seeding probably will be more common.

We have disked down kudzu in the fall and drilled the grass seed. Severe fall disking of kudzu may result in injury from cold. Kudzu will stand more disking in the spring than it will in the fall.

Rescuegrass seed is very light. We have mixed about 5 pounds of grass seed with each 100 pounds of complete fertilizer of 4-8-6 analysis and drilled 500 pounds per acre, with the drill set for 600 pounds. We planted immediately after mixing so as to avoid seed injury. In the spring the grass was top-dressed with 100 pounds per acre of ammonium nitrate.

We have harvested as much as 500 to 800 pounds of rescuegrass seed per acre the year following fall seeding. These plantings were made on good seedbeds on cropland that was in moderately productive condition.

Within a few years there should be ample supplies of seed available from healthy strains, as rescuegrass is a prolific producer of seed of good quality.

# WATER CHANGED THIS FARM

**W**ILLIAM JACOBS runs a Grade A dairy and is a member of the Golden Guernsey Club. Two deep wells and a carefully managed irrigated pasture are largely responsible. Biggest factors, of course, are the Santa Rosa Soil Conservation District and the SCS techniques.

Jacobs did not prosper as a dry-land farmer in Sonoma County, Calif. His cows suffered for want of green forage in spring and fall. They hardly more than paid their keep. Jacobs did well to run a Grade B dairy in 1944.

Today the contrast is almost unbelievable. Jacobs' pastures are green and lush. His cows have green forage from mid-March to mid-November. Water helped Jacobs win the California award of merit for all-around dairying. His cows average more than 400 pounds of butterfat. Golden Guernsey milk brings better profits, too.



Mr. and Mrs. Jacobs, Marylin, and James in tall fescue pasture.



Golden Guernseys of Jacobs herd, back-high in pasture of tall fescue, birdsfoot trefoil, and Ladino clover.

Jacobs worked for wages on the 270-acre dry-land farm before buying it in 1943. As owner, he put into action a good many ideas he developed as a hired hand.

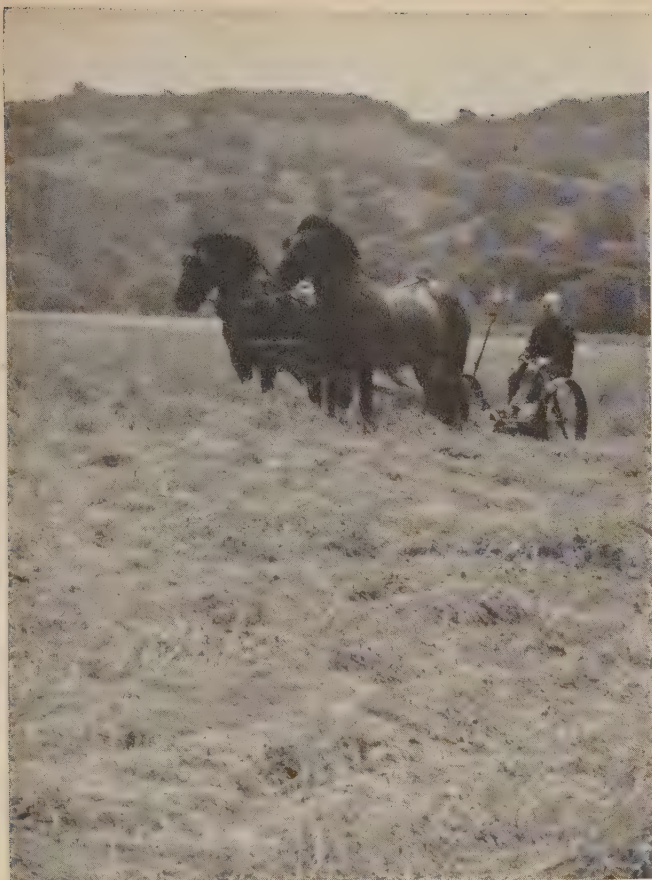
A bit of sudden and unexpected good fortune started him on conservation planning; he tapped a supposedly dry well! The well which people had thought to be dry for a quarter century gushed forth enough water to irrigate 36 acres.

He began putting in new pastures before he used a drop of the well water. He plowed and disked 26 acres of the old dry land. Then he let the chopped sod rot for a month. Then came two more diskings just before seeding. Jacobs first drilled in 15 pounds of Sudangrass, as a nurse and quick-hay crop. Next day he seeded the rest of the mixture, which included 4 pounds of big trefoil, 1 pound of Ladino clover, and 3 pounds of alfalfa per acre. He followed up by smoothing the ground and irrigating.

Jacobs made good use of his well water. He began using sprinkler irrigation, a system which is fast growing in favor in the Santa Rosa Soil Conservation District. Water was applied at the rate of 3 inches every 14 days after cutting the hay in May.

He has worked out a pattern for sprinkling which saves time and labor. He moves his sprinkler line 80 feet instead of the usual 40 to 60 feet. He gets good water coverage by staggering the outlets every 40 feet.





**Volunteer hay crop of ryegrass, vetch, and oats being cut on William Jacobs farm. This crop averaged 2 tons per acre.**

Last summer, with two wells, this Bennett Valley dairyman irrigated 50 acres of good forage. He will soon have another 50 acres ready for watering. Eight irrigated fields are in his rotation grazing plan. His dry-land pasture is divided into 10 fields.

Jacobs feeds very little hay from June to November, while his 70 cows are on the irrigated land. He also cuts down on dairy feeds. From November to February the cows are in open feed lots and feed barns, where they get half a ton of hay daily and 12 pounds of dairy feed per cow. Last year he fed 30 tons of purchased hay along with the hay he cut for winter feeding. The cows are on dry-land pasture from February to June.

Each fall Jacobs put on 300 to 500 pounds of complete commercial fertilizer per acre. He stopped using barnyard manure because, he says, it sows too many weeds in his fields.

Jacobs' income has climbed along with his herd's good butterfat record. Most of his profits have gone back into building a Grade A dairy. He buys good breeding stock and uses only the foremost

Guernsey bloodline. Not long ago he proudly nailed a Golden Guernsey Club sign on his barn door.

He expects his cows to beat the 400-pound butterfat average his herd made last year. In 1950 the top cow of his herd, a 16-year-old, produced 648 pounds. She turned out 705 pounds the year before. Two of his cows are doing better than 500 pounds of butterfat.

Now that Jacobs' irrigated pastures are producing so well, he has branched out into beef production. Not long ago he bought 320 acres of adjoining dry land which he will use as pasture for his beef herd — but that is another story.

**EFFECTIVE DEMONSTRATION.**—Conservation of soil and water is everybody's business. It's the kind of business which is taken seriously by the Nebraska Conservation Foundation, Inc. The foundation, which is broad enough to include State leaders in industry, was organized by the Bankers Association 2 years ago.

In 1951 the foundation had one of the most outstanding and popular agricultural exhibits at the State Fair at Lincoln.

A map showed the location of acid soils in the State. Large photographs told the need for soil testing, revealed the results of corn grown under different crop rotations and varying amounts of organic or commercial fertilizer. An interesting feature was a plant-testing demonstration.

An article on the Nebraska Conservation Foundation, Inc., appeared in our issue for February 1950.



**Dick Donahoe conducts demonstration of plant testing at Nebraska State Fair.**



Intermediate wheatgrass planted on 3.2 acres on Bennett Lindsay farm, near Heber, Utah, in 1950, last year produced seed valued at \$2,025 plus 220 bales of highly palatable straw for livestock consumption. Here is part of the planting.

## A PROMISING GRASS FOR THE WESTERN RANGE

By DeWITT C. GRANDY

**B**ENNETT LINDSAY is an ardent supporter of the theory that good land use and grassland farming go hand in hand. He finds that grass is a profitable cash crop whether grown for seed production or for harvesting by livestock.

Lindsay, who farms with his three sons near Heber, Utah, was the first to plant intermediate wheatgrass in the Wasatch Soil Conservation District, of which he is vice chairman of the board of supervisors.

A trial quantity of intermediate wheatgrass seed which Lindsay obtained from the Soil Conservation Service was drilled in rows 30 inches apart on 3.2 acres of clean-tilled land in the spring of 1950. The seedbed was firm and slightly moist at the time of drilling.

Since irrigation water is rather scarce in the Heber area, the grass planting was not irrigated the first year. During the summer of 1950, some annual weeds appeared and the area was sprayed

with 2-4D in preference to cultivating between the rows.

Ben Lindsay, a son, observed that the grass looked rather lonesome during the first summer in rows 30 inches apart. This proved to be a distinct advantage, for the next year the individual grass clumps grew as large as 18 inches in diameter.

During the second year the grass planting was irrigated only once, the water being turned on around July 15. In 1951, apparently because of its vigorous nature, the intermediate wheat grass seemed to control the weeds, making it unnecessary to spray or cultivate.

When about a third of the seed heads had ripened in 1951, Lindsay cut the wheatgrass with a binder. The bundles were shocked and allowed to dry for about 3 weeks. Then they were threshed with a combine harvester, the straw being baled. The basal leaves of the grass were green at the time of harvest, so 220 bales of high-grade straw were obtained. This was highly palatable and was readily eaten by range livestock.

After recleaning, 1,446 pounds of seed were harvested, or 452 pounds to the acre. During the

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Note.—The author is soil conservationist, Soil Conservation Service, Heber, Utah.



summer of 1951, commercial concerns in Utah were selling intermediate wheatgrass seed for around \$1.40 per pound, which made Lindsay's seed crop worth about \$2,025, or \$632.80 per acre.

It now appears that intermediate wheatgrass has a promising future in Utah and other western range States. In the Wasatch Soil Conservation District, several farmers now are planting this grass with alfalfa in the place of smooth brome-grass. The stiffer stems of intermediate wheatgrass seem to hold up heavy crops of alfalfa and keep it from lodging. Recovery after the first cutting also appears to be better than in the case of smooth brome-grass. Because of its drought-resistant qualities, the wheatgrass can be planted where irrigation water is uncertain or limited, and still reach heights of 4 to 5 feet.

Where rainfall is in excess of 15 inches and soils are of medium depth, intermediate wheatgrass has done well in Wasatch County on sagebrush, oak, and aspen sites. This grass may replace smooth brome plantings in the aspen sites because of its excellent seeding, vigor, and ability to produce well on soils that are low in plant nutrients.

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**LEVELING SHALLOW SOILS.**—The new leveling method, worked out by technicians of the Corning, Calif., headquarters of the Soil Conservation Service, makes land leveling simpler and cheaper. Already the plan has cut earth-moving work on some farms as much as 70 percent.

A good share of the more than 6,500 leveled acres near Corning is benchland above the Sacramento flood plain. Some of the shallow backland benches slope as much as 20 percent and are underlain with hard subsoil. Very little moisture gets past the topsoil. Roots have a tough time growing, and, consequently, crop production is poor on the shallow benches.

Many dry-land farmers, with grain crops of 5 to 10 bushels per acre, consider leveling the best way to make their lands pay. Swinging over to irrigation is giving them a new lease on life. Irrigated pastures on these soils are productive and profitable.

But farmers often shy at leveling shallow soils. If they cut too deep, they're in hardpan. If they don't cut deep enough, they're still in trouble—water won't run evenly. The "mean leveling plan" is made to order for owners of shallow soils.

Take, for example, a piece of hummocky, sloping land. Most farmers skim off a layer of soil clear

across the field. On shallow soils they end up with a field of bald, barren spots.

Under the new method, they don't hit hardpan because they're working only with the shallow topsoil. Several benches may result before they're through making all the cuts and fills. These benches will not interfere with watering because they are all properly graded. The important thing is that the topsoil remains on top.

Mrs. Hazel Falls, who farms in the El Camino community near Corning, planned to move about 5,200 cubic yards of earth to grade 10 hummocky acres the conventional way. SCS technicians showed her that the leveling job could be cut to 1,750 cubic yards by leveling to three natural benches in the field.

Today Mrs. Falls says she is glad she followed the recommendation. Bench leveling cut the cost of the job to one-third the early estimate.

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#### **PEANUTS UNDER DROUGHT CONDITIONS.**—

G. G. Goss of Rising Star, Tex., raised a peanut crop on little more than an inch of rain.

Goss is a supervisor of the Brown-Mills Soil Conservation District. His soil is in good physical condition, as befits a veteran conservation farmer. It is well-loaded with organic matter. Evaporation is low. His peanuts therefore made full use of what scant rain actually fell: 75/100 inch July 1, 9 days after planting; 3/10 inch August 11; and 25/100 inch four times in September—too late to do much good. But Goss made more than 10 bushels per acre.

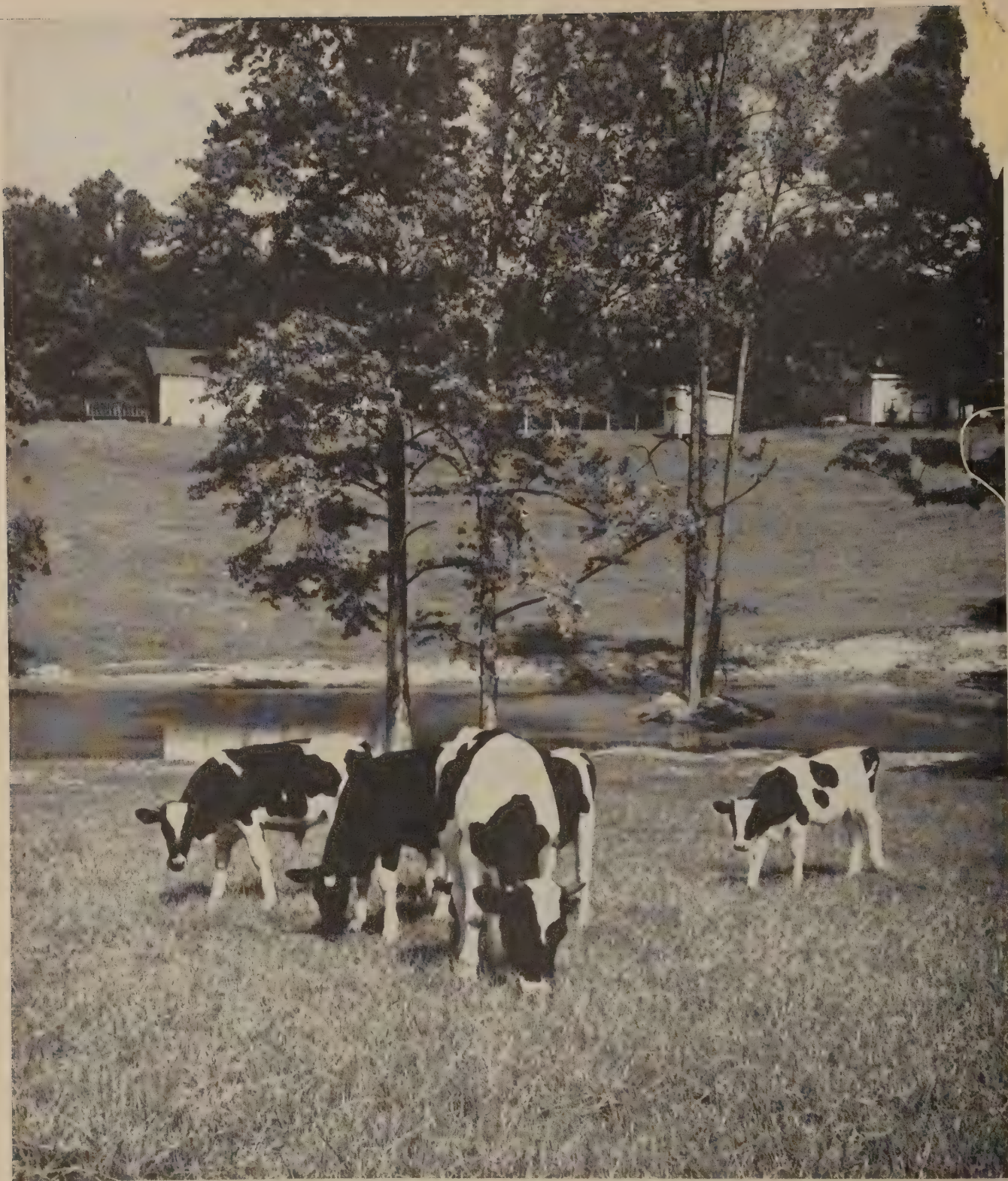
Peanut crops in the same area failed on farms that had not been under conservation 2 years or longer.

Goss uses a rotation of soil-improving rye and vetch with his peanuts. He wind-strips his peanut land with maize interplanted with summer peas. He leaves the maize stubble and peanut hay as protection against wind erosion.



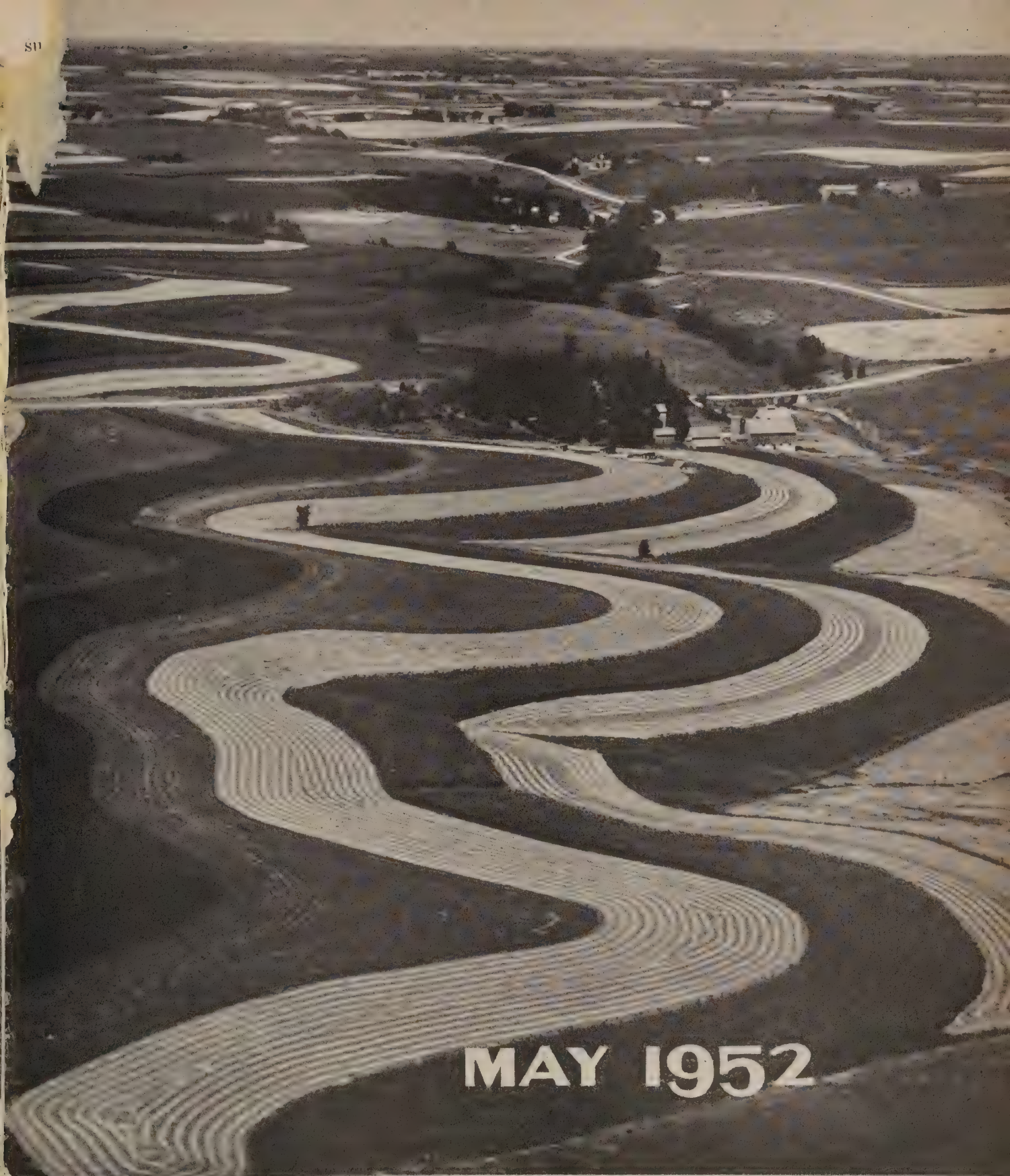
Goss with peanuts.





*These Holstein yearling steers are grazing on one of the great plants of the modern conservation era, a plant variously known as tall fescue, Kentucky 31, and Festuca elatior arundinacea. Seeded in October and clipped in June, just before this picture was taken, the field is in the farm of G. S. Evans, near Irwin, Va. Photographer: Hermann Postlethwaite.*





MAY 1952

# SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE



# SOIL CONSERVATION •

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ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE

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WELLINGTON BRINK

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Art Work by

W. HOWARD MARTIN

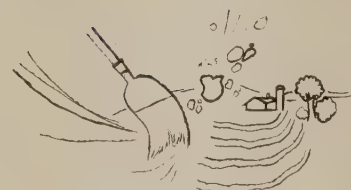
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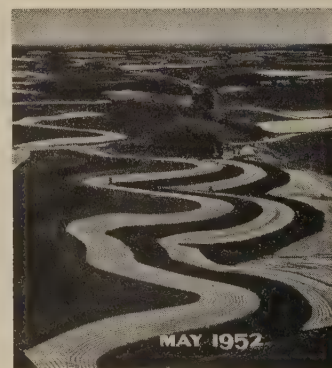
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**CLEARING THE WAY FOR BETTER PRODUCTION.**—On his Spring Hill farm in northeastern Massachusetts, Harold Rogers, following his conservation plan, removed the stone walls separating seven different fields and pulled the tract into one 12-acre field for operating as a single unit. He also cleared 27 acres of brush for pasture and hay land, and improved 17 other acres for pasture. From bottom land he removed flood deposits of sand so that good crops could be grown there.

**McCLINTIC HONORED.**—In recognition of his efforts in the field of conservation, the West Virginia Soil Conservation District Association has awarded a life membership in the association to Dr. C. F. McClintic, State director of conservation. The award was made at the supervisors' annual meeting at Jackson's Mill in appreciation of his long service on the State Soil Conservation Committee and his instigation of the co-operative agreement between SCS and the West Virginia Conservation Commission, under which district cooperators receive the benefit of advice from commission technicians in game management, forestry, and other conservation practices.



**FRONT COVER.**—This fine aerial photograph by W. H. Lathrop, made in July last year, shows strip cropping on the farm of Arno Kregel, which is 1½ miles west of Garnaville, in Clayton County, Iowa.

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# HERE'S WHAT IT TAKES TO BE TOP HAND!

By WILL HARVEY

COLORADO stockmen received much favorable publicity during 1951 for their practical efforts at improving their land and livestock when the *Western Farm Life* magazine and radio station KOA of Denver sparked a Range-Livestock Champion contest to name the State's Top Hand.

The unique feature about the program which is going into its second year is that, insofar as known, this contest is the first to put major emphasis on range improvement. Contestants who used public-domain land were cited for the way they cooperated with Government agencies in carrying out a constructive grazing program.

Frank Fehling of Nathrop, chosen Top Hand in Colorado in 1951, supplements his own holdings with 7,040 acres of Taylor grazing land in Park

Note.—The author is assistant editor, *Western Farm Life*, Denver, Colo.



Part of Fehling's cow herd on upland pasture. Note the good stand of native grass.

County, and approximately 13,760 acres of land in the Pike and San Isabel National Forests. His ambitious program to stop erosion with the use of heavy dirt-moving equipment to divert runoff water by terracing and filling gullies caught the



Frank Fehling shows his RLC branding iron to Governors Dan Thornton of Colorado (left) and Frank Barrett of Wyoming. Mrs. Fehling looks on.



eye of Government engineers, who are faced with similar problems on the public domain.

A dozen leaders representing groups actively working for the improvement of Colorado's pastures, ranges, sheep, and cattle joined with Jim White, editor of *Western Farm Life*, and Don Peach, Mile High Farmer at KOA, to work out the rules of the contest, develop a score card, and outline the working plan for judging on the county and regional levels. Soil conservation leaders endorsed the program enthusiastically, as did extension agents and a hundred local stockmen's associations.

The success of the contest was largely due to the efforts of the 12 men who worked with White and Peach to lay the ground work. They included Dave Rice, secretary of the Colorado Cattlemen's Association; Grett Gray, secretary of the Colorado Woolgrowers' Association; Kenneth W. Chalmers, Colorado State conservationist for the Soil Conservation Service; Charles L. Terrell, extension conservationist, and Ford Daugherty, livestock specialist, both of the Colorado A. & M. College extension service; Paul Swisher, commissioner, Colorado State department of agriculture; Don Daily, secretary of the National Association of Soil Conservation Districts; John T. Caine III, representing the National Western Stock Show and the Denver Union Stock Yards; W. G. McGinnies, director of the Rocky Mountain forest and range experiment station; H. J. Burback, regional conservationist of the United States Bureau of Land Management; Edward Cliff, then regional forester of the United States Forest Service; and Frank Temple of Hayden, Colo., representing the Colorado Association of Soil Conservation Districts.

To get the ball rolling the services of local cattlegrowers' and sheepgrowers' associations were enlisted to nominate some 80 stockmen from among whom the Top Hand was finally selected. Extension agents, soil conservation technicians, forest rangers, and district graziers all helped the stockmen pick their local nominees by April 15.

By August 1 three-man judging teams consisting of an extension agent, a soil conservationist, and a rancher had picked 31 county Top Hands. Men from one county judged contestants in another county. District or regional judging was done on a similar basis by the first of September, limiting the field to eight contestants for the title of Top Hand in Colorado.

Much interest was aroused through the press and radio in the excellent job being done by stockmen in conserving their natural resources. The three specialists selected as finalist-judges were D. A. Savage, superintendent, United States Southern Great Plains field station of Woodward, Okla.; Tony Fellhauer, extension livestock specialist, University of Wyoming; and Ivan Watson, extension animal husbandman, New Mexico A. & M. College.

A motion picture was made during the judging and is being shown before groups of ranchers in Colorado, as well as before service clubs and organizations. Illustrating how Top Hands carry out water spreading, sagebrush eradication, irrigation, and general range management, this picture will be a great help in carrying the contest into its second year. It includes many views of good stands of pastures, sleek cattle, new methods of feeding, and representative shots from prairie, mountain, and forest ranges.

The score card worked out by the advisory group covered vegetation, soil, livestock, and management and leadership. A possible 1,250 points were allotted to vegetation, 750 to soil, 2,000 to livestock, and 1,000 to management and leadership.

Most contestants carried out systematic plans for improving their ranges. None of them was grazing more stock than his ranges could carry. Protection of the soil from erosion and provision for soil improvement were commonly practiced by these ranchers.

When the finalist-judges computed their scoring, it was found that Top Hand Frank Fehling had earned an average of 4,703 points out of a possible 5,000. The average rating for the following classes of improvement, as compared with the maximum possible in each category, indicates why he is considered the best rancher in Colorado today:

Fehling scored 1,171 points for his use and care of vegetation, as compared with a possible 1,250 points. His use and care of the soil brought him 690 points out of a possible 750. For livestock, he was granted 1,908 of a possible 2,000; for management and leadership, 934 of the possible 1,000.

Frank Fehling, at 64, is a vigorous hard-working rancher who grazes his Herefords on summer ranges in the San Isabel and Pike National Forests at elevations upwards of 10,000 feet. He also uses Taylor grazing land and deeded land in the same area.

He runs a herd of 500 breeding cows. Although



1951 was a record dry year on his range, judges found it in good shape with ample grass, and his cattle were fat.

Comments made by the finalist-judges when their task was finished speak well for Colorado ranchers who were selected as regional Top Hands. Said Dave Savage:

"Harvey Harris of Sterling is doing an exceptional job of reseeding go-back lands. There are many such opportunities awaiting other ranchers in Colorado and the Great Plains area. Some of his irrigated valley and meadow land has been greatly improved.

"Frank Fehling is doing a fine job in this respect, developing an extremely heavy carrying capacity on his valley irrigated meadows and pastures.

"Chester L. Mayer of Eagle, another regional Top Hand, is doing a splendid job of establishing irrigated pastures, leveling and fertilizing them.

"Calvin Hixon of Ordway is renovating meadows and using tillage implements to work over the soil. By ripping it up, he is able to get the necessary moisture in the soil.

"He uses a system of flood irrigation and is doing an outstanding job of diverting water from a small creek to adjacent land. Similar progress can be made by other ranchers in the Great Plains area. This matter of water spreading is extremely important in getting the full value out of our natural resources. We are certainly impressed with the wonderful progress Colorado ranchers are making in this respect."

Tony Fellhauer made these pertinent observations:

"I was particularly pleased that these eight district Top Hands all show heavy production per unit and at the same time are building up their land. The judges were impressed with the fine spirit of competition shown by the contestants.

"Wallace Wineinger of Ordway prided himself on the uniform quality of his cattle. R. Wade Peterson of La Jara likewise has an excellent group of cattle.

"We were up at G. N. Winder's ranch near Craig, in the northwest corner of the State. Norm Winder is an outstanding example of a man producing heavy lambs. His wool clip averages about 10 pounds per animal.

What is the grand strategy of this country?

Put very simply, it is a two-handed job. With one hand we are seeking to deter communist aggressors from risking a third world war. With the other, we aim to help the hungry and disadvantaged peoples of the world alleviate the misery and hopelessness on which aggressive communism breeds. We seek to give to these people the solid hope for a better life which is the indispensable requisite for lasting peace.

*From an address by the Honorable Charles F. Brannan,  
Secretary of the United States Department  
of Agriculture.*

"Down at Eagle on the western slope we visited Chet Mayer, as Dave mentioned. He is doing particularly well in handling the problem of public-domain range. His is a well-balanced operation, both in feed and range conditions, and he gets heavy production with quality cattle. A master fence-builder, he arranges his fences on the contour so that the cattle graze at increasingly higher levels as the spring and summer ranges get their growth.

"We saw an excellent example of soil use at Jim Price's ranch near Byers. He literally ties the land down with legume and grass pastures bringing water onto it with pumps. A good number of his neighbors are not livestock operators. They might profit in the long run by watching what Price is doing. Many of them are following what Dave Savage terms the extremely alarming practice of repeating the serious mistake made in World War I of plowing up the native land and placing it under cultivation, going into straight wheat production."

Ivan Watson said that he had been absent from Colorado for the past 10 years, and was impressed with the progress that has been made on ranches throughout the State. "The folks we visited," he said, "are conservation minded, and are doing a good job at management."

Mr. and Mrs. Fehling were honored as Top Hands during the National Western Stock Show in Denver. The eight regional Top Hands received plaques commending them for their superior use of the land.

# MORE Food and Fiber

FROM FEWER ACRES



By R. E. UHLAND

**Secicea like this helped to increase beef production in South Carolina in 1951.**

**O**N THE BASIS of present trends, it is estimated that another 2.6 billion pounds of meat per year will be required by 1960 — along with an added 8 billion quarts of milk and 583 million dozen eggs—to feed our increased population. The United States Census Bureau estimates that by 1960 there will be a minimum of 18 million more people in the United States than in 1950. This will call for an increase of more than 8 percent in our production of food and fiber over that produced in 1950 if we are going to maintain our present standard of living.

Data presented from the Southeast—where erosion has been serious and soil deterioration excessive—show that by applying better farming practices, much more food and fiber are being produced on less acres. The average number of acres of land in harvested crops in 10 Southeastern States for the period 1927-36 was 51,193,000, compared with an average acreage of 47,522,000 for 1948 and 1949. This represents a decrease in cropland of 7.2 percent, most of which was planted to grass or trees.

The statement has frequently been made that farmers can't afford to reduce their cotton and corn acreages. These statements obviously were made on the assumption that reduced acreages meant

reduced production and lower income. Statistics of the United States Department of Agriculture show, however, that although the acreage planted to corn in the Southeast for the 5-year period 1945-49 averaged 18.4 percent less than for the 10-year period 1927-36, the average total production was 31.1 percent greater. The per-acre yield averaged 55.8 percent greater. For the years 1948-49 the corn acreage was 16 percent less but the production was 45.6 percent more, and the per-acre yield was 73.7 percent greater than for the 10-year period.

Similarly, the cotton acreage for the 5-year period 1945-49 was 37.1 percent less than for the 10-year period 1927-36, but the total production was only 8.2 percent lower. For 1948 and 1949 the average acreage was 24.7 percent lower than for the 10-year period, but the production was 14.8 percent greater. The per-acre yield averaged 45.8 percent more. For the last 2 years the per-acre yield was up 54.1 percent.

For this latter period (1945-49) the oat acreage was increased 75.8 percent. The per-acre yield was 46.6 percent greater and the total production was 157.5 percent over that for the 10-year period 1927-36.

The average acreage of tame hay harvested during the period 1927-36 was 7.1 million acres—with an average per-acre yield of 0.86 ton. The average

Note.—The author is research specialist and liaison officer, Soil Conservation Service, Washington, D. C.

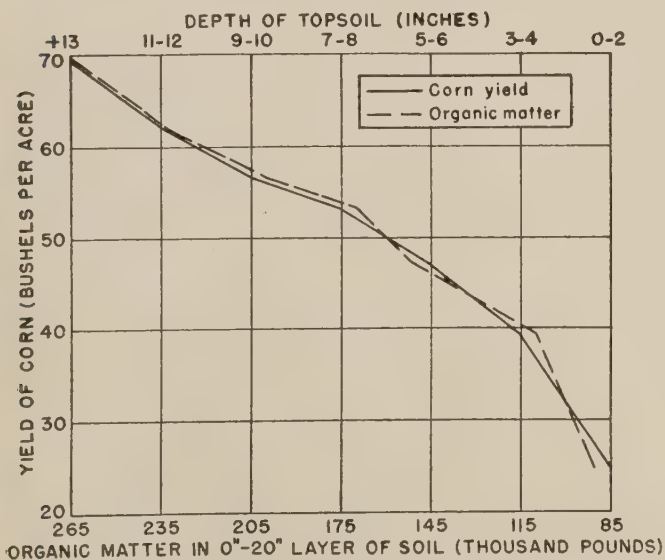


acreage of hay harvested for the 2 years 1948-49 in the same States of the Southeast was just under 10 million acres—an increase of 39.9 percent. The per-acre yield was increased 29.1 percent, and the total production 80.1 percent.

As might be expected, these marked changes in acreages of major crops, together with big increases in winter cover crops and improved pastures, have brought major increases in the numbers of livestock in the Southeast. For example, the average number of all cattle and calves (including cows and heifers kept for milk) in the 5-year period 1935-39 was 3,925,000. The average value was \$33.96 per head. For the years 1949 and 1950 the average number of all cattle and calves (including cows and heifers kept for milk) in the same States was 11,879,000. Their average value was \$94.40 per head. The average annual value of the cattle kept on farms during the earlier period was \$133,298,000. For the 2 years 1949-50 the average value was \$1,121,371,000. Thus, there was an increase of 202.6 percent in the number of cattle in the region. The average value increased 741.3 percent.

Many factors have obviously contributed to these revolutionary changes in the agriculture of the Southeast. Conservation farming has been one of the major factors. In addition to the immediate monetary returns that have been attained, there is assurance that these increases will continue far into the future.

Factual data was obtained in 1939-40 on the rela-



Loss of topsoil by erosion causes decline in organic matter and crop yields. (Based on data from 19 fields, Fowler, Ind.)

tionship between corn yields and depth of topsoil on field studies which were carried out by the Soil Conservation Service in cooperation with the State Agricultural Experiment Stations of Indiana, Ohio, Iowa, and Missouri. These field studies were designed to give a measure of the soil that had been removed from fields representing different slope classes with respect to degree and length, and also tell us how these losses had been affected by the way the land had been used since it was first brought under cultivation. The data obtained showed that at all locations erosion greatly reduced the amount of topsoil. The extent of the reduction of topsoil was regulated by the type of management that had been used on each field. Soil and water conservation practices were shown to check erosion and bring about immediate and continuing increases in corn yields. The relationship between soil depth, organic-matter content, and corn yields is well illustrated in the data secured on 19 corn-fields near Fowler, Ind., in 1940. As most farmers have observed, there was a direct and highly significant correlation between the depth of topsoil and the corn yield, and organic matter decreased markedly as the depth of topsoil was reduced by erosion.

Experimental results from soil and water conservation experiment stations throughout the country show that erosion losses and runoff are excessive on all sloping land when cropped to clean-tilled crops such as corn, cotton, tobacco, and peanuts. For example, results on the Southern Piedmont Conservation Experiment Station at Watkinsville, Ga., show that approximately 5 tons of soil are lost in producing one bale of cotton on Class II land with a 3-percent slope, 29 tons on Class III land with a 7-percent slope, and 68 tons on Class IV land with an 11-percent slope. The data show further that although the average rainfall for the 9-year period 1940-48 was 52.63 inches, 11.83 inches (22.5 percent of the rainfall) were lost as runoff from land cropped annually to cotton. An average of 24.5 tons of soil per acre was lost each year in the runoff water. This was in contrast to 6.4 inches of runoff and 6.35 tons of soil lost from adjacent land where cotton was grown in rotation. The average annual loss from adjacent land in a good rotation was 5.7 inches of water and 3.24 tons of soil per acre.

An acre-inch of soil weighs about 150 tons. Thus, when soil is being lost at rates of 25 to 50 or more





*Top, left.*—Little erosion occurs with such a cover of cornstalks and crimson clover. *Top, right.*—Sericea is an excellent legume for hay and for improving soils in the southeast. *Bottom, left.*—This field of blue lupine in Georgia yielded 32 tons of green manure per acre, equivalent to 800 pounds of sodium nitrate. *Bottom, center.*—Crotalaria, a reseeding legume, supplies much nitrogen and organic matter. *Bottom, right.*—The double-cut plow method works well for killing the sod, yet keeping it on or near the surface.

tons per acre annually, it requires but 3 to 6 years to lose an inch of topsoil. Since different degrees of erosion, as reflected by different depths of surface soil, are portrayed by different crop yields, we are able to evaluate a soil conservation program in terms of time to erode an inch of surface soil and thereby predict the degree of permanency of the soil and the rate of modification or change. Data from all of our experimental stations, together with survey data, show that the rate of erosion and reduction of topsoil has been regulated by the type of management that has been used. Soil and water conservation practices have been shown not only to check erosion, but also bring immediate and continuing increases in crop yields.

*Soil and water losses can be further reduced.* Although progress has been made, and farmers are shifting to a more diversified system of cropping

and are making better use of their crop residues, much more remains to be done. Our research data show that more than three-fourths of the erosion from land in row crops in much of the Southeast takes place during the spring and summer months. We must find effective and practical ways of further reducing these losses, especially during the spring and summer.

At Clemson, S. C., and Blacksburg, Va., implements and methods are being tested for utilizing summer and winter cover crops and plant residues as surface-mulching material. The cultural methods are designed to prepare the land for planting, leaving the residues from the cover crops and preceding crops on the soil surface. We have found that the reduction in erosion and runoff has mainly been proportional to the quantity of cover that remains on the surface.





**Top, left.**—Cotton in graded rows provides good drainage with little erosion. **Top, right.**—This corn, grown in contour strips following sericea, yielded 53.7 bushels per acre as contrasted to 10 bushels where corn followed corn. **Bottom, left.**—Kudzu on Class IV land helped in producing milk on test farm. **Bottom, right.**—Irrigation boosted production of fescue and Ladino clover on Class IV land in South Carolina, 1950.

These tillage methods have gone through considerable evolution and improvement as tools have been adapted and developed. A loose, clean seedbed free of clods is difficult to obtain, especially on some soils and following some crops. To accomplish this, our research men at Clemson, S. C., developed a spiked rotary implement to break clods. This implement is being used in conjunction with middle-buster shares with moldboards removed to open and prepare for planting furrows. No reduction in corn or cotton yields was experienced during the 8-year period of the test.

Where vetch and rye were plowed under and clean-tillage methods were used, runoff and erosion were less than half as much as where clean tillage was practiced with no winter cover crop. The average runoff from the tract where the mulch, disk harrow, spring-tooth tiller method was used was

about one-fifth of that from the clean-tilled corn plots where no cover crop was grown. The runoff from the tract on which the mulch, disk harrow, modified middlebuster method was used amounted to one-eighth of that from clean tillage and no cover. The erosion loss from the tract where the mulch, disk harrow, spring-tooth tiller treatment was used was about one-fifth, and when the mulch, disk harrow, modified middlebuster method was used it was one-fifteenth that from the plots with no cover crop.

In Virginia the double-cut plow method, where the top 3-inch sod layer is inverted and simultaneous subsurface tillage takes place to a total depth of 7 inches, constitutes an effective erosion-control practice. Information is still lacking on the best method for preparing seedbeds following the basic tillage operation. The practice offers good protec-



tion against erosion but needs further investigation for adaptation to various soils and different cropping systems.

Studies at Raleigh, N. C., show that by controlling "row grade" for tobacco, erosion losses as well as runoff can be markedly lessened. More work is needed, however, before general application to other cultivated crops can be made. The possible savings warrant further trials.

Supplemental irrigation insures higher yields. Supplemental irrigation is under test at several locations in the Southeast. In 1950 the annual rainfall at Watkinsville, Ga., was 45.2 inches, with variations in monthly amounts ranging from 8.07 inches in October to 0.43 inch in November. Five drought periods were recorded when 14 or more consecutive days had no more than 0.25 inch of rain on any 1 day. Soil moisture was lacking for short periods in April and July. Irrigation applied during these periods gave beneficial results. One irrigation of 1.5 inches on July 3 on upland corn increased the yield of grain from 57.7 bushels to 74.4 bushels per acre—a gain of 16.7 bushels. A similar application on cotton increased the yield of seed cotton from 1,087 pounds without irrigation to 1,430 pounds per acre with irrigation. Two or more irrigations per season on pasture land has boosted grass growth and returns from beef and milk.

Soil conservation is being studied on a realistic basis. Its practical application to a typical 100-acre farm owned by the Southern Piedmont Conservation Experiment Station at Watkinsville, Ga., has been under test for the past 11 years. This farm unit has been operated by a tenant under an approved conservation plan. Very complete records have been kept of the cost of all operations and of all sales and expenditures.

For the first 6 years mules supplied the power, while for the last 5 years a one-row tractor and allied machinery furnished by the Agricultural Engineering Department of the University of Georgia have been used to produce the crops, except for harvesting the small grain, lespedeza, and sericea seeds, and baling the hay. The tenant used the tractor each year on the station to repay his share of this expense.

The operation of this farm has supplied much practical information and has attracted wide interest throughout the Southeast. All the farm's cropland is rotated and supporting conservation

practices are used. Last year there were 7.5 acres of cotton, 10.6 acres of corn, 21 acres of oats, 7.5 acres of wheat, 25.5 acres of Kobe lespedeza, 14.7 acres of perennial hay, 12 acres of improved pasture, and 1.2 acres for buildings and a garden. Ten milk cows were kept on the farm, and in 1950 they produced 58,669 pounds of milk, testing 5.3 percent butterfat. The tenant has had a satisfactory income each year, and a good return on the investment has been received by the landlord.

*There has been gratifying progress, true, but much remains to be done.* Farmers throughout the country, and especially in the Southeast, have found it profitable to use larger and larger quantities of mixed fertilizers. It is obviously practicing poor economy, however, to tolerate the high losses of plant nutrients through erosion that are occurring simultaneously with the return of these nutrients in purchased fertilizers. By reducing erosion, the actual return from fertilizers per dollar expended can be markedly increased. Fertilizer applications have had to be increased repeatedly, mainly because of the large quantities of plant nutrients that are lost through crops and erosion.

The Southeast is making headway. This is evidenced by the reduction in acreages of corn and cotton, which are erosion-inducing crops, and a corresponding increase in the acreages of small grain and hay, which allow much less erosion. In spite of substantial acreage reductions of corn and cotton, the per-acre yields have been sufficiently increased so that the total production is markedly higher. Livestock numbers have more than doubled, as compared with the 10-year period 1927-36, and their annual value has increased 741 percent.

It is imperative that we be on the alert with our research so that we may find more effective and more practical ways of conserving the productivity of the soils. This is especially true of the Southeast, where emphasis must be placed on the improvement side, since so much erosion and soil deterioration have already occurred.

Obviously, in this fast-moving scientific age, with ever-increasing demands for food and fiber, we can ill afford to sit back complacently and say, "We know enough now. Let's apply what we know." By all means, we want to speed application, but we must also increase our research efforts to find more effective and more practical ways of conserving and improving the productivity of our soils if we are going to maintain our high standard of living.



# 1952 DISTRICTS CONVENTION

**W**ATERS S. DAVIS, Jr., League City, Tex., rancher, was reelected to his third term as president of the National Association of Soil Conservation Districts at the sixth annual convention of the National Association of Soil Conservation Districts in Cleveland, February 25-29.

Attendance at the convention was estimated at more than 1,800, with representatives registered from every State and Puerto Rico. Capacity audiences heard a series of nationally important speakers, including Secretary of Agriculture Charles F. Brannan, Governor Earl Warren, of California; Dr. Robert M. Salter, Chief of the Soil Conservation Service, and Senator Robert A. Taft of Ohio.

But, in addition to the speech making, it was a real working convention, too. Committees brought out detailed, thoughtful reports on subjects ranging through cooperation with public-land agencies, watershed programs, legislation, education, district programs, publicity, and finance.

Nor was it purely a man's convention. More than 125 fully registered participants were women, and they reelected Mrs. Don G. Fredericksen, of Gooding, Idaho, as president of the ladies' auxiliary—see the "District Profile" by J. Boyd Price in our January 1952 issue. A special ladies' program including speakers, luncheons, and tours, was a feature of the convention.



Reelected: Davis

Delegates and observers were high in their praise for the convention arrangements and facilities provided by the hosts—the Ohio Federation of Soil Conservation Districts and the Cleveland Farmers' Club of the Cleveland Chamber of Commerce.

## A BANK FINDS WORK ON THE LAND

By C. C. COOPER, Jr.

**I**CAN, with all sincerity, tell you that our bank has as much regard for, and places as much value on, soil conservation as do the most enthusiastic exponents. It would indeed be a short-sighted policy to ignore or fail to assist in every way pos-

Note.—This article is taken from an address by the agricultural field representative of the Valley National Bank of Arizona at a meeting of the Arizona Association of Soil Conservation Districts.

sible a program which is promoting the value and efficiency of the principal industry in the area it serves.

As a community prospers or declines, so do its banks. Soil conservation measures, wisely conceived and properly applied, produce the same benefits for a man's future and security as do sav-

ings accounts. Remembering this analogy, a bank cannot fail to appreciate the importance of soil conservation.

Another way to appraise this regard would be to realize that the value of a bank's assets are closely related to the assets of the rancher or farmer. For example, when a bank makes a loan it shows that loan on its books as an asset. The quality of that loan or asset is largely dependent upon the quality of the land, crops, or machinery behind it. We can assume, of course, that the loan would not have been made if there were any doubt of the ability or integrity of the borrower. These last two factors are of the utmost importance in qualifying a loan but, unfortunately, they do not show up in the collateral file. A bank examiner can't see them nor run them up on an adding machine. These men value our loans during periodic examinations largely on the basis of the value of our collateral, and assume the ability and integrity factors are there.

And so you can see how important the proper application of soil conservation is to the bank because of the improvement and the protection it promotes for our banks and this State's most valuable asset—productive soils.

The Valley National Bank has always, and will always, do everything possible to assist soil conservation and the soil conservation districts. Let me now point out some of the ways in which our bank is working with you.

First of all, it has *created* loaning methods which directly finance certain soil conservation practices. I'll discuss these in a little more detail shortly.

Next, its loaning officers give great weight to the existence of soil conservation measures on a piece of property, when analyzing the credit factors involved.

Further, we make loans to districts and to individuals for the development of machinery, equipment, and services for carrying out soil conservation work.

The bank also takes an active interest in the progress of the soil conservation districts, several of its officers being members of a soil conservation district. Personnel of the bank meet with conservation groups to talk with them about mutual problems. You will find that the bank instigates and encourages favorable publicity for this work. The contribution of the bank along these lines is often hidden from general view. The reason for this

anonymity stems partly from the fact that banks can't discuss the business of their customers with others, nor can it publicize its accomplishments too much without giving the appearance of bragging about a job it is supposed to do.

Now to go back to some of the direct ways we are able to finance soil conservation measures. At present we make these loans in three ways—by taking an assignment of the cooperator's PMA payment; by increasing the amount loaned under a crop mortgage, where production justifies it; and by direct loans to soil conservation districts for equipment.

Indirectly we assist in the financing of soil conservation measures by processing loans to farmers and ranchers for the insurance companies. We do the investigating, qualifying, and handling of applications for long-term money from certain insurance companies. This type of loan gives the operator an opportunity to obtain low interest, long-term money upon which he can build a conservative program over a period of years.

We also indirectly add to a man's ability to obtain financing for conservation measures by giving considerable weight to the fact that he is a cooperator. We do this because we know that we can depend more on the care of his productive assets. For instance, we can be more assured of an improving supply of feed and water in a case of a cattleman who is a cooperator. Similarly, we can give weight in our evaluation of the earning capacity of a farm that has a soil conservation plan because we consider it an indication of sound management. In another way, we indirectly aid soil conservation by assisting in the development of ventures whose purpose it is to perform certain conservation work or who supply equipment or materials related to it.

We offer incentive to the use of conservation practices by giving preferred credit positions to the cooperator. We *insist* on the use of soil conservation practices where long-term credits are involved.

We encourage the participation of a borrower as a member of the soil conservation district. We encourage the formation of soil conservation districts. We follow, analyze, and encourage legislative measures which are related to the success of conservation. We offer financial advice to the districts. We create special loaning techniques for granting them credit on an installment basis.



## DISTRICT PROFILE

GEORGE BARTON  
of  
UTAH

George Barton, at the age of 29, is the youngest director of the National Association of Soil Conservation Districts. His experience and background well qualify him for the position.

Barton was born and raised in Manti, Sanpete County, Utah, where he has been herding sheep, punching cows, and farming all his life. In this arid and mountainous, yet productive, country livestock raising is the main industry.

Barton, his father, and his two brothers are in partnership. Theirs is a complex and extensive enterprise. They run a few flocks of sheep and herds of Hereford cattle on a range. This includes summer range on the National Forest and private



mountain ground, winter ranges on the Taylor grazing lands in western Utah, and privately owned range lands at medium elevations for spring and fall grazing.

The Bartons also have become very active in the registered-herd business. They run a herd of registered Hereford cattle, and have made a specialty of purebred Columbia sheep. They have shown and sold their Columbia ewes and rams at the leading livestock shows throughout the West.

Due to the long winter in the intermountain country it is necessary to raise considerable winter feed for these purebred herds. Therefore, the Bar-



tons must also be farmers. All farming land in this area is irrigated from the mountain streams and pump wells. The limited amount of available farm land and the shortage of water make conservation farming a necessity.

The variety of his operations gives George a well-rounded, practical background for his broad responsibilities in the field of soil conservation.

Proper land management on the farm and on the range, he says, is the key to ultimate success. A strong advocate of proper range management, George Barton wants to see the range produce good feed, and he wants, too, to see the livestock

business become a more stable and secure industry in the West. He knows that good range management is the key to stability, but he is afraid of and vigorously opposes the idea so prevalent in the West these days that the only way to improve the range land is to remove all the livestock. He believes that conservation and utilization must work together.

Public control of public lands is necessary, he agrees, but the cattle and sheep growers who use those lands need to have some assurance of security in their future use before they will put forth too much money and effort in range improvement. He believes that most livestock people are more conservation-minded than is commonly believed. This, he says, has been demonstrated by the interest the range livestock people have shown when working on their private lands in cooperation with soil conservation districts. There is plenty of room for range improvement on privately owned ranges, says Barton, and this is one place where the soil conservation districts can make a big contribution to the future of the western livestock business.

On their private lands the Bartons have carried on an extensive range-seeding program in an effort to assist range recovery and improve range-plant vigor.

It was through this work that George became acquainted with the soil conservation district movement. He has been a member of the Sanpete County Soil Conservation District board of supervisors for several years and for the past 2 years has served as chairman. He served one term on the State Soil Conservation Committee, and for the past 2 years he has been the vice chairman of the Utah State Association of Soil Conservation Districts. For the past year he has been one of the directors of the National Association.

In addition to being an ardent conservationist, Barton is active in civic and church affairs in his home county. He believes that to be a good citizen one must be a real conservationist. He recently stated, "Until we get every last person engaged in agriculture to understand and truly believe our basic soil conservation objective, there will be a big job ahead for everyone participating in soil conservation district work. We must believe that truly 'the earth is the Lord's and the fulness thereof,' but the responsibility for its stewardship is vested in man."

—C. W. ZUMWALT.

# GOOD PASTURE *from* BRUSH LAND

By HERB BODDY

**P.** E. "PETE" CARLSON—part-time farmer of El Dorado County, Calif.—has an improved dry-land pasture which turns out 20 to 30 times as much forage as the old brush land.

Carlson works the day shift with the county highway department. He has to wedge in his farm chores the best he can. Since buying his 80-acre farm in 1943, it has been touch and go, raising chickens and fattening calves by twilight and on week ends. He has had to make his free time really count. By dint of careful planning he is fast putting his sloping lands in top working order.

Pete Carlson's sprinkler-irrigated, well-fertilized bottom-land pasture has been a money maker from the start. It's the steep uplands above his home and barn that have been tough to handle. Slopes are from 10 to 35 percent and until he began turning them into pasture 5 years ago, they had a dense brush cover.

Of course, Carlson wishes he had more good bottom land. What farmer doesn't? But, with no new flat land close by, and so many hilly acres available, he had only one course open—he must make the uplands pay.

Carlson was hopeful, but not too optimistic in 1946 when he called on directors of the El Dorado Soil Conservation District for help in turning his

Note.—The author is in the current information division, Soil Conservation Service, Portland, Oreg.



Pete Carlson and A. G. Carns inspecting dry-land pasture plants in early spring of 1951.





**Glimpse of Carlson's dry-land pasture in early spring of 1951. This field was once brush and trees.**

brush land into pasture. When Art Carns of the Placerville SCS staff came out to his place, he found the rancher in a receptive mood. Carlson started right in clearing a 13-acre brushy piece. As soon as the brush was off, he worked up a good seedbed by disking and plowing.

By the fall of that year, Carlson was ready for drilling. He used a seed mixture of Hardinggrass, burnet, and bur-clover, which was well adapted to the dry lands of northern California.

The next spring, Carlson got a first cutting of 12 tons of hay from the field. The following spring,

he grazed six head of beef there. Then he let the stand grow and harvested 18 tons of hay in June.

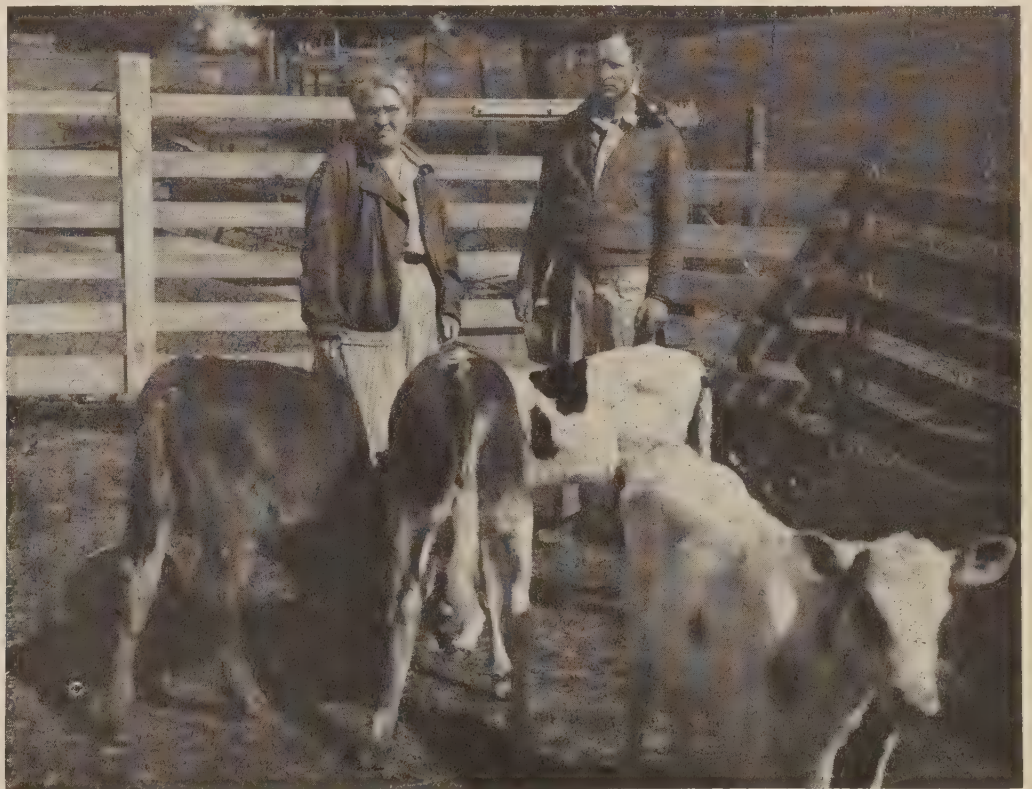
In establishing the seeding, Carlson says the only priming he did was to broadcast 200 pounds of superphosphate in February 1948.

Hardinggrass has caught the eye of Carlson as a top forage producer. It grew higher than his horse's head in 1947. He recalls how his annual hay crops of vetch and grain froze out during the bitter cold winters of 1949 and 1950. In spite of the cold, his Hardinggrass still produced 1 ton of hay per acre, half its normal yield.

The prolific growth made by the dry-land seeding is reflected in results of field checks conducted by Carns. He stretched a series of 3-foot-square boxes across the 13 acres. Grass in the boxes was clipped during the growing season to simulate grazing. Carns weighed each test, cutting off green forage, and then dried it to get the hay weight.

Production records listed green weight on a per-acre basis as 4,833 pounds. The air-dry weight of hay, on a per-acre basis, figured 3,736 pounds.

Using a net figure of \$15 per ton for hay harvested and a mark of \$2 per animal-unit month for grazing, Carlson's planting paid for all costs at the end of 2 years. His field should continue to produce at a good rate for 10 to 15 years or more.



**Mr. and Mrs. Carlson, with calves raised on their farm.**

# ALL MUST WORK TOGETHER TO MEET PRODUCTION GOALS

**T**HE TIMES call for 100 percent teamwork—from everybody—every Soil Conservation Service technician, Production and Marketing Administration committeeman, county agent, or Extension specialist, soil conservation district supervisor, Farmers Home and Farm Credit Administration employee and farmer committee people, and so on.

The farmers of Ohio and the rest of the Nation have been asked to meet in 1952 the highest production goals in history—more corn, more barley, more wheat, more grain sorghums, and another big crop of cotton. At the same time, they are going to be handicapped in meeting these goals by a smaller labor supply and a tightening situation in such other important farm production facilities as machinery and parts, fertilizers, and pesticides.

Moreover, nobody knows for how many years we may be called upon to go on producing at the record or near-record pace American agriculture has been setting for the past decade. We do know that, no matter how soon longed-for peace returns to the world, the farmers of the United States will have to continue to produce in abundance. That will be necessary in order to maintain our own fast-growing population's high standard of living and to meet export and other demands.

It follows, then, that we are going to have to keep the American farm plant in top producing condition. To do this, we must drive ahead with agricultural research without interruption. We must take the fullest advantage of conservation and other technical knowledge. We must preserve the democratic, farmer-administered conservation machinery in the soil conservation districts and the Agricultural Conservation Program. We must likewise maintain farm credit, rural electrification, and other facilities which, all together, make possible an increasingly efficient farm production job.

In short, we must keep looking ahead for ways of giving more and more service to American agriculture—to the farmers of Ohio and the Nation—per dollar expended.

**By HON. CLARENCE J. McCORMICK**  
**Under Secretary of Agriculture**

Perhaps the most promising step we have taken in a long time, Department-wise, is in the practical coordination of our agricultural resources conservation services, under the Secretary's Memorandum No. 1278 of a year ago. I believe that we have in this an opportunity that some of us may not fully appreciate, despite the fine progress that has already been made in putting the plan into effect. I say this by way of emphasizing the immediate and potential importance of the coordination move, especially with respect to the successful development of our Agricultural Resources Conservation Program in the years to come.

I want to commend you Soil Conservation Service men for the way you have pitched in and helped in putting the provisions of Memorandum No. 1278 into operation from the outset. I am sure that the farmers with whom you work have observed how the representatives of our Department agencies concerned have tightened up their lines of teamwork still further, and are speeding the conservation job along accordingly.

The progress that has been made in housing Department agencies in the same town and same building has been gratifying. Ohio is one of the States which already have consolidated State offices of the largest agencies. And I noticed that up to December the consolidation of FHA, SCS, and PMA offices in the counties was well along, with 43 percent of the consolidations accomplished by that time. I know I hardly need to remind you district conservationists of the space and other problems that very often are involved in providing this desirable one-stop service for the farmers who have business to transact with more than one agency.

I hope that all of you who still have some of those problems to work out will push ahead with a view to completing the office consolidations as soon as

Note.—These remarks are from an address made by the Under Secretary at a State meeting of Soil Conservation Service district conservationists in Columbus, Ohio, Feb. 7, 1952.





**Hon. Clarence J. McCormick.**

possible. It certainly will be a real satisfaction to farmers and Department people alike when the job is finished and the offices situated in any given county are brought together—PMA, Soil Conservation Service, Farmers Home Administration, Federal Crop Insurance Corporation, and any others located there.

The farmers you serve also are interested in considerably more, of course, than the physical office arrangements. They are interested in the still closer cooperation and more unified service in these agencies' conservation work with farmers. That is something else which this realignment of Department facilities in the States and counties will produce.

For example, farmers having complete farm plans worked up in soil conservation districts are expected to use these plans as a guide in determining the conservation practices to be carried out under the 1952 ACP. By the same token the county and community committeemen need to do the best possible job of screening applications for Soil Conservation Service technical assistance, to save the time of you conservationists, and to assure sounder programs.

As a result of such coordinated efforts in carrying on our conservation programs, we will have faster application of soil and water conservation measures on the land. Naturally, there are numerous details to work out and local procedures to develop in order to arrive at the smoothest working operation; but the reports so far show even more progress than was anticipated by this time.

I have in mind, for instance, the revision that has been made in the basic technical planning procedures to help meet the increasing demands for technical assistance from soil conservation district and ACP participants. I understand that your conservation planning already is being expedited as a result. That, of course, is because under the revised system the farmer is able to go ahead immediately with his simpler practices while he is developing his complete farm plan of permanent conservation.

This in no way weakens your long-established basic Soil Conservation Service policy of treating and using land according to need and capability. To the contrary, Memorandum 1278 specifically states that to be the conservation objective of the Department.

It also strengthens the Department's support of the farmers' soil conservation districts—that is, by charging both the Soil Conservation Service and the Production and Marketing Administration to encourage jointly the creation and development of such districts. Although more than four-fifths of our farms and ranches and three-fourths of our farm land are covered by approximately 2,400 districts now, every farm and every acre of farm land in the country should be in such districts.

It has been the Department's policy to cooperate with soil conservation districts ever since the first ones were voted into being under State enabling laws in 1937. It subsequently has made the services of your own and other agencies available to the districts, at the request of their local farmer supervisors, through formal memoranda of understanding. The farmers in these democratically organized and democratically managed districts have amply demonstrated that if we provide them with sound and efficient technical and other assistance, they will keep pace in leadership, progress, and production accomplishments.

That is the cue for all of us in turn to bring all of our farm program facilities to bear upon the common farm conservation problem. Perhaps the most obvious opportunity for doing this is in tying more closely together the technical assistance of the Soil Conservation Service and the financial assistance of the Agricultural Conservation Program. I am sure all of you have observed that farmers generally find they reap the maximum conservation benefits when the services of both programs are used simultaneously.

We can't afford to overlook *any* practicable means of speeding along the conservation job. We must improve the productive capacity of the Nation's land if we are going to meet increasing demands upon it when they arise. Our soils are capable of supplying the huge demand now being placed upon them—if we manage them right. And there is abundant scientific evidence and practical history as well to show that we *can* make our soils produce enough to meet current needs, and also to provide for the long pull.

What we have done in the past, however, may not be good enough for the future. Thus meeting our 1952 production goals would fill all essential military and domestic requirements this year, and provide for exports at current levels. But it would not build up reserves of feed grains and some other commodities to desirable levels. Although sound land-use practice is a limiting factor in further cropland expansion, it would be short-sighted to sacrifice our remaining productive land even for this worth-while purpose.

Also, we need always to remember that land and *water* must work together if we are to have sustained productivity. Ohio has just experienced the latest of the Nation's recurring, costly floods. Earlier in January, it was southern California that drew the flood headlines. Last summer, it was the "billion dollar flood" in Nebraska, Kansas, and Missouri. And every year, in different parts of the country, floods along the smaller tributary streams take a toll in life and property. They may cost an aggregate of three times the cost of the less frequent major floods like those on the Ohio and the Missouri.

There have been major floods, of course, since the earliest days of record. The great Ohio floods of 1884 and 1898 still are not forgotten. Neither is that of 1913, when the overflowing Scioto River brought Columbus its most destructive flood. But, as man has determined to live and build on the flood plains or wherever he wishes, he likewise must learn to manage the land and water within his control in such a fashion as to reduce flood damage and destruction to a minimum.

Flood protection is a vital necessity—for the farms as well as the cities. Flood prevention and control must begin by treating land and water together as a part of a broad, multiple-purpose effort in which the land and water resources are con-

served and utilized to serve the various needs and purposes of the people. We need to deal with water management and control from its very beginning on the land where rain and snow come down and water starts to flow downhill. And that is where we need the water most—right where it falls.

Watershed conservation treatment has been basic in your Soil Conservation Service program from its start. Watershed management, important in itself, is necessarily a part of a broader program in which structural measures in the main stream and in the tributaries have a necessary place. There is nothing basically incompatible about the objectives of both kinds of work, watershed management and structures for regulation and use of water in the channels.

But it is necessary that all structures and measures carried out under both kinds of work be designed to fit into the most effective total integrated program to serve the needs of each drainage basin and its subdivisions. This fact points up the need for joint and coordinated planning in the river basins.

The Department of Agriculture has worked for many years in discharging its responsibility for resource protection and use in various river basins. We have directed our efforts at conservation land and water use on the forest lands, grasslands, and cultivated lands, and the waters which feed or drain them.

This has involved, and will continue to require in greater degree, the fullest cooperation and teamwork among our own agricultural agencies and programs as well as others, local, State, and Federal. The importance of this complete watershed approach has been demonstrated over and over. Here in Ohio, the success of coordinated treatment and development of the Muskingum watershed, through the Muskingum Watershed Conservancy District, has become an outstanding example of community, State, and Federal cooperation in this field.

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**HIGHLY PROFITABLE.**—Looking back over 8 years' experience with conservation farming on his 105 acres near Bel Air, William Choate, dairy farmer in the Harford (Md.) Soil Conservation District, recalls numerous gullies on his place, one of which would hold a wagon and a team of horses. "Productiveness of my farm has been restored so effectively that I get from 30 to 35 percent more crops from every acre that I plant," says Choate.



# SEED ALONE CAN MAKE GRASS PROFITABLE

By A. E. McCLYMONDS

**G**RASS has been eulogized as the forgiveness of Nature, but more important, it is one of the soil and water conservationist's best tools.

Its uses are many, among them the protection of waterways through which excess water is routed, and the improvement of soil structure and organic matter in cropland.

But while doing its conservation tasks and producing increased pasturage and hay, grass has also provided farmers and ranchers of the Northern Great Plains with a tremendous money crop through seed production.

This is shown by a report of the Bureau of Agricultural Economics for the year 1950. The Northern Great Plains States—Kansas, Nebraska, North and South Dakota, Montana, and Wyoming—were among the leaders in the production of more than 300 million pounds of seed of 13 grasses.

These States produced all the seed of two species, Russian wildrye and buffalograss, reported for the Nation in 1950. Largest production was smooth brome grass seed which totaled 23,260,000 pounds

Note.—The author is regional director, Soil Conservation Service, Lincoln, Nebr.



This intermediate wheatgrass was seeded in 20-inch rows specifically for seed production. It is on the land of A. Rand and C. E. Hageman, near Hawk Springs, Wyo., down in the South Goshen Soil Conservation District.

in the Northern Great Plains region, or 79 percent of the Nation's output. Nebraska was way out in front with 14 million pounds.

This grass seed was harvested from cropland seeded to grass-legume mixtures temporarily as part of the crop rotation, from grassed waterways, from pastures on which grazing was deferred, from odd areas that had been seeded to grass, and from plots where the grass had been seeded in rows and cultivated specifically for seed.

## *Seed production for all 13 grasses in the Northern Great Plains States*

Kind of seed	Amounts	Portion of United States total		State in region
		Pounds	Percent	
Bluestem mixtures .....	220,000	9.3		Kansas, third
Smooth brome .....	23,260,000	79.0		Nebraska, first; Kansas, third; North Dakota, fourth; South Dakota, fifth; Montana, eighth
Buffalograss .....	81,000	100.0		Kansas, first; Nebraska, second
Blue grama .....	120,000	21.8		Kansas, second; Nebraska, third
Side-oats grama .....	200,000	54.0		Kansas, first
Sand lovegrass .....	350,000	51.0		Kansas, first; Nebraska, fifth
Crested wheatgrass .....	5,400,000	92.0		Montana, first; Nebraska, second; South Dakota, third; North Dakota, fourth; Wyoming, fifth; Kansas, eighth
Intermediate wheatgrass .....	190,000	56.0		Nebraska, first; Wyoming, South Dakota, tied for fifth
Slender wheatgrass .....	120,000	75.0		North Dakota, first
Tall wheatgrass .....	30,000	32.0		Nebraska, third
Western wheatgrass .....	103,000	89.5		South Dakota, first; North Dakota, second
Canada wildrye .....	44,000	92.0		North Dakota, first
Russian wildrye .....	30,000	100.0		North Dakota, first



**This waterway was once a gully. Now it produces a good harvest of hay; brome grass, reed canary grass, western wheatgrass, alfalfa, red clover. And it provides a safe avenue for disposal of excess water from adjoining land. It is on the farm of H. N. Erskine, Cass Soil Conservation District, Nebr.**

Increased grass-seed production was largely the direct result of the establishment on the land of sound soil and water conservation plans worked out by the 113,800 cooperators with soil conservation districts in the Northern Great Plains region.

These cooperators seeded over 1,431,000 acres to grass to retire from crop production those parts of their land found unsuited for cultivation. Over a million acres of this was seeded for pasture and range. The rest was for hay.

They also seeded 109,000 acres of grassed waterways, and over 4 million acres of cropland to grass and legumes as part of the long-time crop rotation.

The production of the seed of adapted grasses is an important development for soil and water conservation in the Northern Great Plains.

Seeding done thus far is only part of what has been planned by district cooperators, and a relatively small fraction of what is needed throughout the area. Greater progress would have been made but for one thing—too little seed of adapted varieties.

It has been part of the work of SCS to join with State colleges and others to encourage the production of grass seed. The Service has also had an important part in the propagation of newly introduced and developed grasses, and in the development of ways and means of harvesting, processing, and planting the seed of native and introduced grasses.

Establishment of grassed waterways, from which much seed is harvested, is a general practice in much of the Northern Great Plains region, but something of a problem is posed on those farms

with little or no livestock, when it comes to seeding down the land unsuited for cultivation or using grass in the crop rotation. Experience has proved that grass-seed production is a profitable enterprise that fits into the operations of such units. Even farmers with ample livestock are finding that the use of odd areas for seed production is desirable.

One of these is John Fleming near Hartington, Nebr., a cooperator with the Cedar County Soil Conservation District. He and his partner-son have taken out of cultivation several small areas that did not fit readily into the new field lay-out.

"Two years ago," he said, "we fertilized the odd areas with 100 pounds of ammonium nitrate fertilizer to the acre. In return, we got 3,500 pounds of crested wheatgrass seed from 6 acres and 3,000 pounds of brome grass seed from 10 acres.

"As for crops? Well, even though we've seeded down quite a bit of former cropland in waterways, in odd areas, in the crop rotation, and on land not suited for cultivation, we still are raising more crops than before."

In North Dakota, Gerhard Lund, who is a cooperator with the Rolette County Soil Conservation District, has found that grass-seed production from his land farmed in a strip crop-grass rotation yields a pretty good income while it is in grass. He finds that the fields are like new land when they are plowed after being in grass a few years.

George L. Whitcomb near Cedar Point, Kans., cooperating with the Chase County Soil Conservation District, seeded grass on 100 acres that produced poorly in crops. Three years ago he began reaping the income when 90 acres of brome grass yielded 39,400 pounds of seed and 10 acres of intermediate wheatgrass yielded over 1,500 pounds of seed. The brome grass was fertilized.

A South Dakota illustration concerns crops after grass on cropland. In 1950, 4 years after he seeded brome grass-alfalfa on a field, Clifford Harn, cooperating with the Marshall County Soil Conservation District, broke the land and put it to corn. The corn crop was half again what was considered a good average for the area. While it was on the land, the grass also paid well.

The income from grass-seed production should encourage more farmers and ranchers to produce the seed of adapted varieties. A sufficient supply of this seed is vital to the conservation of the soil and water resources of the Northern Great Plains.



# Regional Study on Farms in Three States Points Out

## SOIL CONSERVATION NEEDS

*Prepared from North Central Regional Bulletin No. 23. Conservation Problems and Achievements on Selected Midwestern Farms.*

**S**UCCESSFUL soil conservation programs result from a combination of good land-use practices, water management, crop and livestock utilization, and a coordinated over-all plan for the farm. This was pointed out in a study of conservation problems and achievements on selected midwestern farms in 12 States\* of the north central region.

Farms used, selected from the group participating in soil conservation practices and keeping farm records, were located in Illinois, Ohio, and Wisconsin. The conservation program on each of the farms studied could have been improved in one or more aspects. But, in each case, income at the end of the study period was better than at the beginning even after allowance had been made for changes in the price level. In most cases, an improvement was evident soon after the beginning of the conservation program.

The Illinois case farms typify an area of moderately large commercial farms on productive land of moderate slope. Conservation problems found on these farms are quite common on cash-grain farms in much of the Corn Belt. They include sheet and gully erosion on sloping lands, drainage on level lands, and fertility maintenance on most soils.

The Ohio and one of the Wisconsin farms offer typical problems of hilly areas. Soil erosion is acute, accentuated by the need for as large as possible acreage of cropland on these small units. Although the general problem presented by these case farms in Ohio and Wisconsin is similar, possibilities for meeting them are different. Dairying is a more profitable enterprise on the Wisconsin farm



**Locations of these farms were selected to represent the different types of farming carried on in the regional area.**

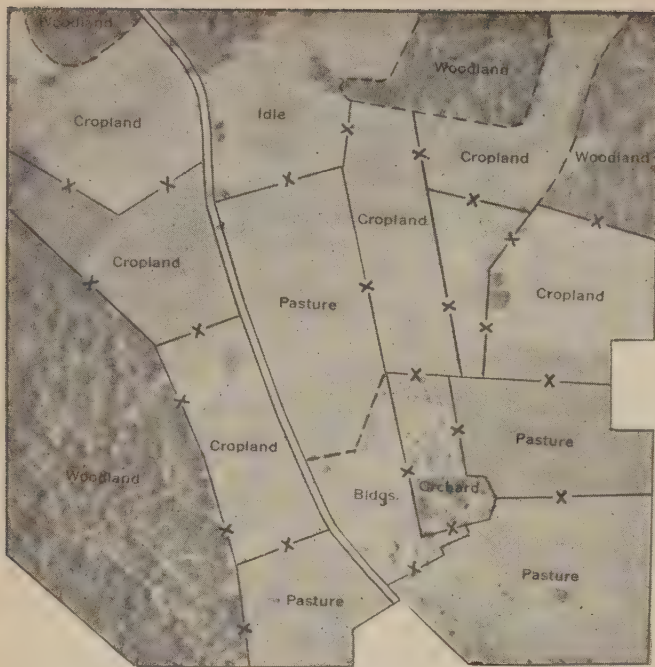
than in the Coshocton County area of Ohio, where farms studied in that State were located.

A Grant County, Wis., farm illustrates the conservation problem of a somewhat larger hill farm. In particular, it points out the greater range of alternate enterprises that are economically possible on larger units.

On all the farms, the study indicated that changes made in adopting the conservation program such as use of grassed waterways, contours and strip farming, investments in fertilizer and redesigning of the fields paid off in higher net income. The addition of a beef-feeding enterprise, a dairy herd, or poultry flock to use the additional grass, grain, and labor that became available was important in changing this income. In many instances the additional enterprise could be fitted in to take up the slack during off seasons or to furnish enough work to keep another person employed full time in the business.

Tenure problems are one of the major "stumbling blocks" to the adoption of conservation practices in the Corn Belt. Making changes in farm organization, such as shifting cropland to hay and pasture, increasing livestock numbers, and payment

\*Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.



Typical Mill Creek, Ohio, farm before conservation plan.

for fertilizers, all bring up questions on how to distribute costs and income.

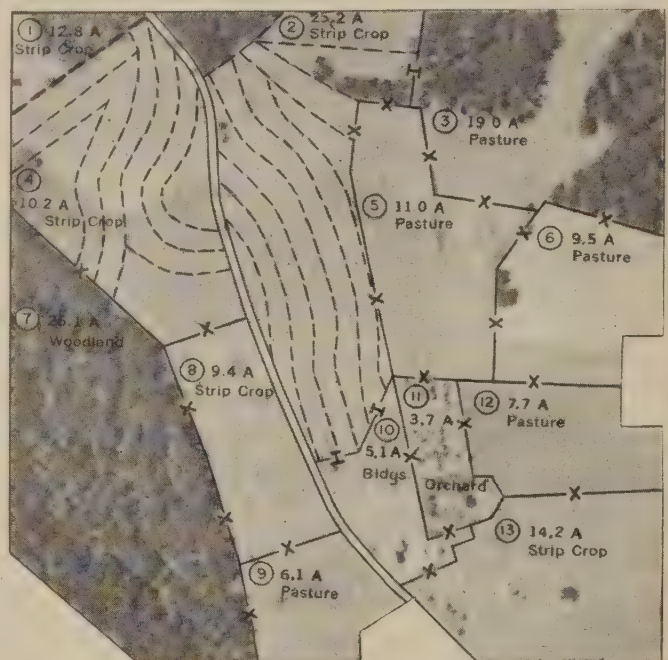
Absentee landlords who want an immediate high return on their investment are not willing to make the adjustments that would allow them to improve their farm income over a period of several years. On many farms the tenant is also interested in short-run profits. This is especially true if he has only a 1-year lease with no assurance of renewal or a lease so designed that he may have to shoulder the major portion of fertilizer and other conservation costs.

One answer to these problems is a lease providing for sharing both crops and livestock. This gives landlord and tenant an incentive to adopt those practices that will give the highest net return over a period of years. It also makes it possible for both to share an equal portion of the costs and returns.

Capital improvements, such as erosion-control dams, new barns, fences, and other permanent or semi-permanent fixtures that are needed to make full use of the conservation program and its production, should be written into the lease. In the case of the McLean County, Ill., farm, the landlord made these expenditures and the tenant made the recommended land-use changes — soil-fertility improvement, new seedings, waterways, and terraces. Many of these problems must be worked out

between the landlord and tenant to fit their individual needs.

Problems on the six hill farms in Coshocton County, Ohio, indicate it's difficult to measure exactly how much a conservation program contributes to income. Practices applied to these farms did not involve severe changes in land use, or heavy capital outlays. Yet increases in yields have been substantial. As these farmers adopted good conservation practices, they learned to improve their farming in other ways. With no changes in total acreage and a reduction of almost 12 percent in cropland, they increased the size of their business, in terms of volume of production, by 75 percent. This increased production is evidence that



Typical Mill Creek, Ohio, farm and field arrangement after adoption of a conservation plan.

these farmers had the capacity to assume greater managerial responsibilities.

The problems these farmers have encountered in developing their conservation programs explain why farmers in similar circumstances have not made so much progress. Small farms predominate in the area. In 1945, the average-size farm in Coshocton County was 128 acres, and 46 percent were smaller than 100 acres. Land is rather hilly, with slopes up to 20 percent being used in the rotation farming. Principal crops include wheat, corn, oats, and hay. Beef and dairy cattle, poultry, and hogs make up the livestock enterprises.



Principal conservation problems in the area are associated with soil erosion and declining soil productivity. These are aggravated by the small size of farms, which makes it difficult to reduce the acreage of intertilled crops.

However, during the 13-year period, net real income increased by about 50 percent on these six farms. Although net income dropped during the first 2 or 3 years of the conservation program, it was due largely to increased conservation costs. Adoption of conservation practices alone will not insure a satisfactory income on all farms. Some farms are too small, or inefficiently managed, to provide adequate incomes. But on small farms conservation practices, if properly employed, should help to improve income even though it may still be inadequate.

## FLY YOUR FARM

By R. J. AMSTERBURG, Jr.

**T**HE FARMERS of Mason County, Mich., are really looking forward to the Western Michigan Fair next year, and it's all due to an idea developed by two members of the local unit of the Soil Conservation Service. The idea of an aerial view of a farm at a reasonable price developed when Ralph Lowery, work unit conservationist, and William Brozzo, conservation aid, were checking some aerial photos to be used for a display at the Western Michigan Fair.

The idea of "flying your farm" to see the problems of erosion and land use was then placed before the directors of the Mason County Soil Conservation District. The directors agreed to sponsor the tour, and it was up to the technicians to lay out the routes to be flown.

Ralph Lowery then went up on an inspection flight of the county and laid out a route which would include conservation practices, erosion problems, and features of special local interest. Some of these spots would be included with the aerial trip over the farm of the person on the flight.

Jack Norton flew the plane, a four-place job that could be used at the local airport, which is immediately in conjunction with the fair grounds.

Note.—The author is work group soil scientist, Soil Conservation Service, Ludington, Mich.

Tickets were sold at the district booth for \$2 each, and the buyers walked over to the airport for the trips. To make this low price possible, it was necessary to take people from the same part of the county simultaneously. This gave the pilot an opportunity to fly across more of the county in a short period of time.

"Flying your farm" became an overnight sensation in the 5 days that the fair ran; over 200 farmers from Mason County were able to see not only their own farms, but also the conservation practices that had been established by their neighbors.

One of the oldest farmers to take the tour was Floyd Wood, chairman of the district board of directors. Mrs. Frank Barclay, a reporter for the local newspaper, also took the tour. She is 70 and the owner of a farm on which she is planting pine trees on contour.

The trips were not confined to grown-ups. In some instances whole families went along. For many of the younger people, it was the first trip by plane. They were able to see some of the conservation practices that they studied in school.

Points of particular interest were contour tree planting, such as the 6-year-old plantation of Archie Wadel in Riverton Township; and the contour strip-cropping system of Ted Lloyd, in the northern part of the county—a farm where the potato yield increased from 125 bushels per acre to 440 bushels per acre under conservation farming, in 2 years.

Sights such as these whetted interest in the local soil conservation program and made some of the local urbanites more conscious of the problems faced by county farmers. The local businessmen, as a result, also are now becoming more soil conservation conscious.

Some of the district cooperators already are asking that this type of tour be made available again at next year's fair. Plans are under way for a still more intensive form of tour, and it is expected that yet more people will make the flights. This will enable Lowery and Brozzo to do an even better job of soil conservation.

**TOSS-UP FOR TOPS!**—Harold and Max Kuehl, who operate farms south of Ormsby, Minn., recently were selected as Martin County Soil Conservation District's most outstanding soil conserva-

tionists. Details of the close decision on which the plaque was awarded are as interesting as their successful soil conservation work. The two farmers' programs matched so closely that the distraught supervisors were ready to flip a coin. But before anyone could dig up a coin, Farm Planner I. H. Burnison suggested naming both Harold and Max as top soil savers for 1951.

Who gets the plaque? Well, there won't be any dispute about that either. Harold and Max are brothers who operate adjoining 120-acre farms. If one brother gets lonesome for the plaque and decides he wants it on his wall for a few days, all he has to do is borrow it.



J. A. Bridwell.

**A FARMER EXPLAINS.**—When J. A. Bridwell, chairman of the board of supervisors of the Spartanburg (S. C.) Soil Conservation District, was asked to talk before the Spartanburg Woman's Club, he explained concisely how a district operates, using his own district as the example. Bridwell's talk follows:

"There are three things which I should like to stress. (1) I am a farmer. (2) I am a supervisor of Spartanburg Soil Conservation District. (3) I am NOT a Government employee, and I am NOT on a Government pay roll. The service I render as a district supervisor is as free as the service you render as a member of this club.

"I make these statements to show you the relationship of farmers and soil conservation district supervisors to each other, and to State and Federal agricultural agencies.

"A soil conservation districts law was passed in this State about 15 years ago because our soil was washing into the Atlantic Ocean, taking with it our greatest source of health and wealth.

"The soil conservation districts law authorized the formation of soil conservation districts in given areas of the State.

"When farmers found that the purpose of soil conservation districts was to conserve soil and water, they voted to form one here in our county.

Farmers in other counties did the same thing. The whole State is covered by soil conservation districts. In fact, every State in the Nation has conservation districts.

"The next step in the district formation was to set up a board of supervisors for each district. The State Soil Conservation Committee appointed two, and farmers within the district elected three, making a board of five farmers to manage affairs of the district.

"We asked the United States Department of Agriculture to send technicians from Soil Conservation Service right out on the land with the farmer to help him know the capability of his land and treat it according to its needs. Soil Conservation Service also furnished some materials to farmers in districts and some equipment.

"Supervisors of soil conservation districts learned early to request help of all State and Federal agencies according to the function of each agency. In our search for help, we called upon private agencies, too. Through districts, governed by farmers, we invited civic groups, bankers, schools, churches, women's clubs, and all interested citizens to help us spread the gospel of soil conservation. Thus, we brought to the aid of farmers in soil conservation districts, our Federal Government, private agencies, and State and local government.

"Through the soil conservation districts, with so much help available, soil and water conservation, and other good land use, appeared on farms of our State and Nation, on public lands and on other private lands used mainly for lumbering or other nonagricultural purposes.

"You ladies know the need for soil conservation. You know that where there is a need there is a responsibility. Therefore, in behalf of farmers and in behalf of our common well-being, I wish to solicit your continued interest in soil conservation, and your influence and help in promoting the purpose of districts, which is soil and water conservation."

**CONSERVATION PRICE TAG.**—The old 300-acre Exton farm, Spruce Run Valley, north of Clinton, Hunterdon County, N. J., has been sold by Richard A. Loeb, who established conservation farming there in 1936, to Raymond Minitz of Blairstown, for \$150,000. Some of the conservation practices started by Loeb during the CCC days are still being followed as originally planned. Minitz, a Hollander who owns several other farms around Blairstown, will continue to operate it as a dairy establishment. There is a mixed 100-cow herd. The property includes three houses, two dairy barns, and a large breeding barn. Previously, Spruce Run Farm was part of the vast estate owned by the Louis Exton family since before Revolution days.





**JUNE 1952**

# **Soil Conservation**

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ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE  
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WELLINGTON BRINK  
Editor

Art Work by  
W. HOWARD MARTIN

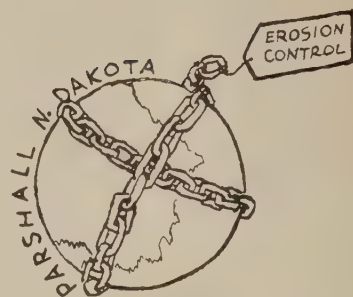
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**SOIL AND CROPS STAY HOME.**—Control of wind erosion saved soil and resulted in crop-yield increases of more than 25 percent on the farm of Charles Phinney, Parshall, N. Dak. Phinney is a member of the board of supervisors of the Fort Berthold Soil Conservation District.

"Strip cropping against the wind, together with stubble-mulch farming to give fallow strips added protection, have done a fine control job," Phinney says. "Wind erosion is practically nil on my place now and the yields have come up."

The Phinney conservation plan includes also some waterways to permit escape of excess water from low areas, a farmstead windbreak, and improved crop rotation. All 337 acres of cropland are now farmed in strips 10 rods wide with stubble-mulch tillage.

**APPROPRIATE AWARD.**—Mouse River district, N. Dak., is awarding subscriptions to the SOIL CONSERVATION Magazine for all district contestants of the Conservation Achievement Program Contest, as well as for supervisors and assistant supervisors.



**FRONT COVER.**—From the air John Busch has captured by his camera a fine view of an orange grove near Gotha, Fla. Contouring is the rule on innumerable young orchards throughout the country, where modern conservation prevails.





This piece of county equipment is as familiar with terrace building as with road maintenance.

## COUNTY OFFICIALS SMOOTH THE WAY

By CHRIS WEBER

**B**Y WORKING hand in hand, the county commissioners of Sedgwick County, Colo., and the supervisors of the Sedgwick County Soil Conservation District have solved a difficult terracing problem and achieved remarkable results for the entire soil conservation program. Cooperation set the stage for the district's first-place triumph in the 1950 Denver Post-KLZ soil conservation contest.

This part of northeastern Colorado is characterized by rich, fertile soils bordering the South Platte River, and the rolling, dry section to the south. The table areas are commonly referred to as "hard lands." A wide variety of soils and crops are to be found. This complicates the soil conservation job even on the best-managed farms.

Martin Sorensen, Emory Price, and Robert Ricker, our county commissioners, were among the first to become interested in the development of soil and water conservation. It was natural that when the Sedgwick County Soil Conservation District was organized in 1948, the commissioners were quick to offer help by providing offices for the district and SCS in the new courthouse where all Federal agencies are housed on the same floor without cost to them.

The county commissioners long had followed the custom of making heavy equipment available to farmers for doing such odd jobs as grading driveways and filling gullies. District farmers naturally turned to the county commissioners for needed help. In the valley farmers needed a lot of land leveling, while those on the tablelands were concerned with terracing and stock ponds. Private



Commissioners Robert Ricker, Martin Sorensen, and Emory Price.

contractors started land leveling almost as soon as the district was launched, but terrace building, new to the area, presented a more difficult problem.

No farmer in the district had the heavy equipment for building good terraces, and none cared to venture an investment for such expensive machinery. The county commissioners were hesitant, being afraid that they might be considered as competing with private contractors, but they soon found that such competition was nonexistent. They agreed to construct terraces with county equipment so long as they were not competing with contractors and did not interfere with road maintenance.

Soon the county was building about three-fourths mile of broad-base terrace per day. Now, all terraces are being constructed by the county at very low cost—a tremendous impetus to the terracing program.

Martin Sorensen, chairman of the board of county commissioners, notes two advantages from

Note.—The author is work unit conservationist, Soil Conservation Service, Julesburg, Colo.

county-district cooperation: first, it promotes more conservation work on the land at lower cost; second, it creates additional work for county equipment, and maintains steady employment without lay-offs during slack periods of road work.

The charge for the large maintainer now is \$6.75 per hour with the operator being furnished; the charge for carry-all and tractor is \$7.50 per hour. The average cost for a mile of terrace now runs around \$90. More than 75 miles of broad-base terraces have been built in the district to date.

The terraces are well-packed and there is little settling. This saved many terraces from "going out" during heavy spring rains. One field received more than 6 inches of rain in 2 days, with 4 inches falling during a brief period. Nevertheless, only a slight "over top" occurred in a few places.

"The district does not own nor do we intend to purchase any heavy dirt-moving equipment," says H. E. ("Hub") Reichelt, Jr., district chairman and 1950 soil conservation champion in the Denver Post-KLZ contest. "It would be foolish to buy such equipment and put the district in debt when we are getting such splendid cooperation from the county commissioners and the private contractors."

Cooperation does not end with terracing. During the peak of the land-leveling season, when private contractors have all they can handle, the county carry-all and tractor are used for leveling and building stock ponds, usually at the prevailing rate.

This unusual arrangement between district and county has done much to stimulate and promote interest in the establishment of permanent soil and water conservation practices.

## OTHER FARMERS LIKED WHAT THEY SAW

By A. E. McCLYMONDS

A RELATIVELY small group of people with land about 7 miles northwest of Hutchinson, Kans., have made drainage history. They organized the Grant Township Drainage District on a small basis after it became apparent that a larger district would be defeated. Then, through their cooperation, they got the necessary drains built without spending much for rights-of-way.

This drainage district is the direct result of teamwork by the people in it, the Reno County Soil Conservation District, and the Reno County commissioners. Now, with the drainage system only a couple of years old, the district has already had its first addition through petition from landowners. There is prospect for several such additions.

The pay-off of such cooperation is not only in the restoration of land to production, but also in keeping the cost of drainage low.

"It hasn't all been smooth sailing," admits Fred Strickler, chairman of the drainage district board



Talking things over: Fred Strickler, drainage board chairman; R. G. Cameron of SCS; and Howard Carey, treasurer.

and owner of a dairy farm. "We first attempted to organize the district on the basis of the whole area that should be served. It soon became evident that this would fail, so it was dropped.

"Then a group did some canvassing and found that there were enough farmers who wanted the drainage and would provide the necessary rights-

Note.—The author is regional director, Soil Conservation Service, Lincoln, Nebr.



of-way, and whose land was so situated that the drains could be built without complications. The district was organized on that basis."

Originally, 3,840 acres were included. This has now been augmented by 1,280 acres.

The farms involved are in the nearly level bottom lands of Cow Creek Valley. They are part of an estimated 150,000 acres along Cow Creek that are in need of drainage.

Cow Creek is notorious locally. It traverses two other counties besides the northern part of Reno County in the 50 miles from its source to Hutchinson, where it enters the Arkansas River.

The creek's channel is small for so large a drainage. So are the channels of the tributaries. Some intermittent side streams lose their channels when they emerge from the higher lands and the water they carry spreads out.

Most of the valley is subject to frequent flooding from the overflow of both the main creek and the tributaries. This happens from three to seven or eight times a year. In 1941 Strickler's farm was flooded seven times.

High-water stages usually pass quickly, but floodwaters remain in the low areas in the nearly level fields. There is no natural escape.

The area also has trouble from below. A high water table makes much of the land too wet for crops or the better grasses; it also brings alkali salts to the surface. The white areas range up to 30 or 40 feet across now, and they are growing.

"We can't do anything about Cow Creek and its tributaries, of course," says Strickler. "All we can do is provide an orderly way to dispose of the water after the creeks go down. That's what the drainage system is for.

"Even if we could do something about the creek, it wouldn't solve all of our problems. We still would have the problem of a high water table, especially in wet years, and still would need drainage."

Start of the drainage-district idea came as a result of the operations of the Reno County Soil Conservation District, where these farms lie. Not much could be done to conserve the bottom land unless drainage outlets were provided. That meant that water from some farms would have to be taken across other farms.

The soil conservation district's board of supervisors—C. V. Warner of Arlington, H. L. Brownlee



Two bulldozers work on the main drain in the first addition to the Grant Township Drainage District.

of Sylvia, Walter Pierce of Hutchinson, and Floyd Goodenough and H. P. Graber of Pretty Prairie—encouraged organization of the drainage district. The farmers formed a committee for the purpose, and SCS technicians made preliminary investigations.

Organization of the drainage district was taken under the Kansas law that permits the county commissioners to act, rather than under the law whereby the organization is handled through the district court.

"The county commissioners have cooperated with the drainage district all the way," says Howard Carey, treasurer of the district's board. "Under the State law, the county builds the bridges and culverts that are over 4½ feet long.

"The commissioners knew that they would have some bridges and culverts to build. But since adequate drainage would reduce road maintenance costs, they favored a drainage district. Furthermore, the county engineer recommended that the district be organized."

Design of the drainage system was handled by SCS technicians, and construction was by contract. And the farmers are well along with the building of field laterals, for which they pay individually.

Every farm in the drainage district has a complete conservation plan, and the laterals are being built exactly as charted. They serve both to remove surface water and for subsurface drainage to keep the water table from getting too high.

Administration of the drainage district and construction of the drains were made easier by the cooperative attitude of the people. Rights-of-way were granted for nominal fees. Little was spent except for actual construction.

"We issued only \$16,000 in 20-year bonds for construction of the system in the original 3,840 acres," Carey reports. "Besides the saving in cost of rights-of-way, we also saved money by not having to go to the trouble of assessing benefits. Every man pays a uniform rate per acre on the land he has in the district. They all wanted it that way."

"The cost of drains and structures built by the drainage district amounts to a little less than 50 cents per acre per year during the life of the bonds. That covers both the interest and the repayment of borrowed money. Or, to put it another way, a farmer needs to raise only 30 more bushels of wheat per quarter section, at present prices, to meet this payment."

Already, the drainage system has had the effect of improving land that is under cultivation, and of making it possible to restore abandoned land to production. Correction of the alkali situation will take time, even though the soil is sandy loam.

The principal trouble on the farm of Clarence Hobbs was standing water in low areas. Even in years when rainfall was not excessive, Hobbs had to farm the low areas separately. In wet years, his crops there were badly damaged.

Now it is possible for him to work all the farm at the same time. It makes his farming easier and less expensive, and he is rid of the surface water before it hurts the crops.

Strickler's fine herd of Ayrshires was all that kept him going. Until the drains were built, Strickler raised only one winter wheat crop in 4 years. On another field, he was not able to raise a row crop in 10 years. His alfalfa became poor because of the high water table, and his pasture was hurt.

Carey had a comparable experience on the section and a half that he bought a few years ago. It has been many years since most of it was cultivated. It had become too wet for anything except some native grasses that can stand a lot of water.

Carey now has laterals on that half section, and has started the bedding system of farming. Last year he got a wheat crop.

"One thing I'd like to call attention to," he says, "is the fact that the laterals were built over a year ago, and they still are flowing, even though we have had no rain for quite a while. That is sub-surface water they are intercepting. This shows pretty conclusively that the ground water table is too high. It explains some of the troubles with

crops, alfalfa, and grass production on the lower lands. Getting rid of this excess water is as important as draining off the surface water."

Farmers who are in the addition to the drainage district still have the work on their lands ahead of them. The main drain was completed in October 1951. *These farmers acted because they liked what they saw.*

Carey sums up the situation this way: "To get the best out of a drainage district, like anything else, requires cooperation among neighbors—not just in organizing the district and building the drains. Frequently, the best way for one farm to reach the drain is across another's land."

"Several illustrations could be used, but I'll merely cite my own. One farmer has a 40-acre field that can best be drained by crossing one of my fields. We have the services of the SCS technicians, who know where the ditches should go. Well, I let him cross my place. Now the ditch is right and benefits me as well as him."

"I know he has better drainage. And I know I'm better satisfied, because he has no water impounded on the field next to mine."

Such cooperation already has paid. It got these farmers a drainage system at low cost. They are getting their wet land back into the high production of which it is capable. And they have set an example that has caused other farmers to join them.

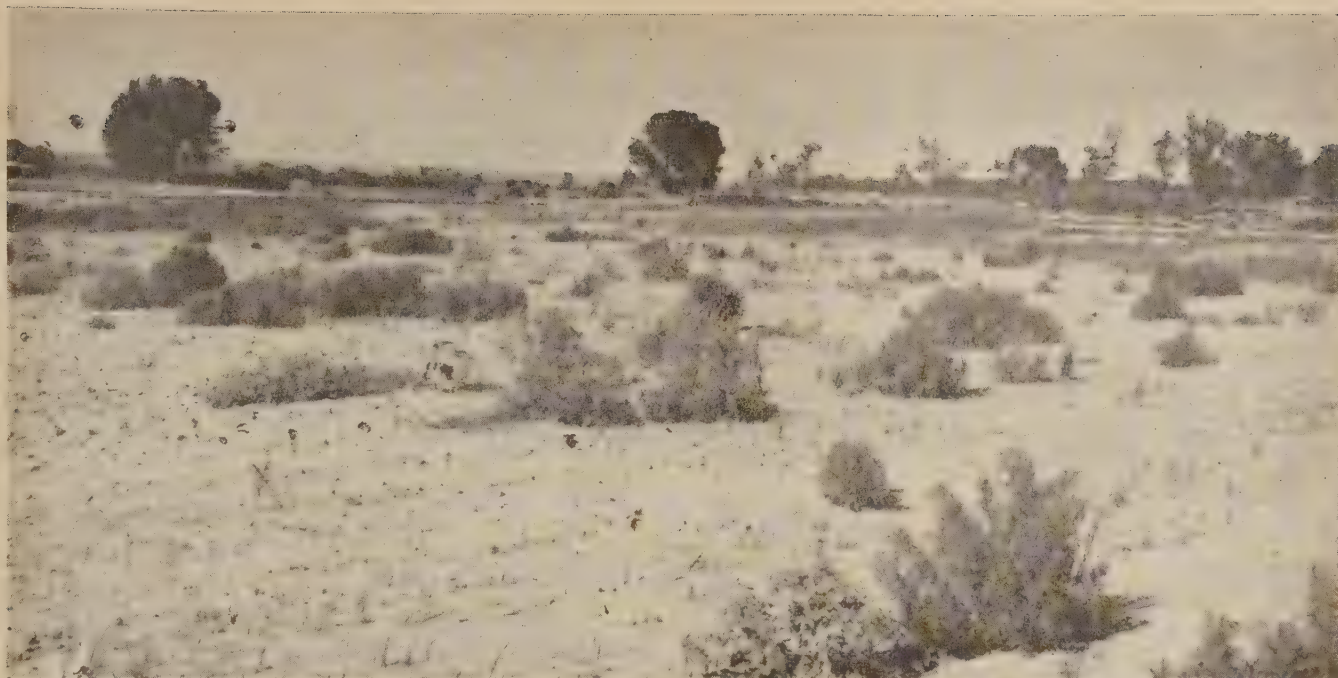
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**UNIQUE FILM SERVICE.**—The Allegany County and Steuben County (N. Y.) Soil Conservation Districts maintain their own library of 44 different films at Belmont. The County Federation of Sportsmen's Clubs and several schools contribute financially to its support.

Robert A. Reed, SCS district conservationist, reports that the films are selected to meet the needs of youth and adult. Annual cost for purchasing of new films and replacement of worn-out prints ranges from \$600 to \$800. The films are loaned to schools, farm groups, and organizations within the two districts. As many as 30,000 persons view the films each year.

A unique feature is that films are not mailed to users. Because use is limited to the two counties, they can be picked up one day and returned the next. Under this system, it is possible to show the same film on six programs in 1 week. Formerly it was difficult to obtain a film on short notice, or when needed, and much time was lost while the film was in transit.





Once a good field of alfalfa on a Pease Bottom farm. Irrigation seepage raised water table; only a few plants survived. Now firm again, this field will be replanted to irrigated crops; the drainage system has lowered the water table to a proper level.

## DRAINAGE RECLAIMS PEASE BOTTOM FARMS

By **TRUMAN C. ANDERSON**

**F**ARMERS in the Treasure County (Mont.) Soil Conservation District, on deciding 2 years ago to cooperate in development of the Hysham Bench irrigation project, determined to avoid so far as possible the mistakes made on old projects.

For a sobering example of a serious error—failure to provide a drainage system that will dispose of irrigation waste water and at the same time control the ground water table by intercepting and diverting seepage water—they needed only to look to the other side of the Yellowstone River in their own soil conservation district.

Land in the 6,400-acre Pease Bottom irrigation district had been badly damaged because of lack of proper drainage. Some of the land was out of production. Some was producing little. The seeped area was spreading. Areas white with alkali salts were multiplying.

A happier story now can be told about the Pease Bottom lands. Through cooperation with the soil conservation district, the farmers there possess a comprehensive drainage system designed by SCS technicians. Construction was on a pay-as-you-go basis. Farmers pooled their PMA payments, then made up the difference from their own pockets.

The same board of district supervisors supplied aid to both the Hysham Bench and Pease Bottom farmers. The same Service technicians who supplied technical services to the Hysham Bench project designed the Pease Bottom drainage system. They did their work so well that some farmers who previously could see no hope for drainage are now finding their lands rehabilitated.

Irrigation began on the Pease Bottom, a nearly level area nestling between the Yellowstone River and the tablelands to the northwest, many years ago. Its story is one that is common in the West. The early settlers first used the flood flows of Alkali, Edwards, and Muggins Creeks for flood-irrigation systems. Then about 1904, they organized the pres-

Note.—The author is State conservationist, Soil Conservation Service, Bozeman, Mont.

ent ditch system, getting their irrigation water by gravity flow from the river. There was more water than could be used, early in the season. But later in the year, when the river was low, little got into the irrigation system and the irrigation water that was dumped into slough areas gradually disappeared. Because there was not a plentiful season-long supply of irrigation water, cultivation was not intensive.

About 25 years ago, a diversion dam was built in the Yellowstone River. It provided enough water for season-long irrigation. Acreages of beets and other intensively cultivated crops increased. More irrigation water than necessary was used, but still there was no way to dispose of the waste.

Consequently, the accumulation of seepage water—seepage from the supply canal which is now full all season, from too-heavy irrigation, and from the dumping of irrigation waste water into depressions—raised the ground-water level near the surface.

Effects of this were first felt on low-lying areas of heavy soil away from the river. The ground-water level stood too high for most crops to grow, while the alkali salts brought to the surface made the land even less suited for cropland use. Through the years, this situation spread until a large part of the Pease Bottom was affected to varying degrees.

Reclamation and conservation of this land started with a request to the district supervisors for technical aid. The Soil Conservation Service, aiding the district, made a topographic survey in 1948 and sank a series of test wells to study the rise and fall of ground water and its direction of movement. The wells also furnished information about the material beneath the surface, which was found to be largely of a sandy nature.

Technicians designed the drainage system after studying the test wells for a year. The very slight slope of the land posed many problems. The planned system contemplated a total of 13½ miles of ditches, including main drains and laterals. At first the farmers thought to organize a drainage district. Then they decided to go ahead on their own.

To date the two principal drains, one of which has two spurs, have been completed and the farmers already have felt the benefits.

One of the happiest men in the Pease Bottom is Leo Cunningham.



The level of the water in this slough fluctuated seasonally with the water table; it was shown by test wells sunk by SCS during study of area before designing drainage system.

"It looked as though it was up to me to find a new farm, because this one was just about shot," he says. "But this year I was able to farm the whole 240 acres normally."

He bought the farm in 1942. At that time, he says, it was in good shape. All was irrigated except one field that was a little high. Cunningham raised a sizable acreage of beets. Then the seepage water and alkali began to spread and by the time the ditch was started the whole farm was in sad state—"even the dry-land field was boggy."

"Today it's a different story," Cunningham reports. "The water table has been lowered. How much? Well, I have a well at the upper part of the farm that had 10 feet of water in it. Now it is almost dry."

"I had a fine stand of wheat on the dry-land field, but hail hurt it pretty badly. The rest of the farm was cultivated and irrigated, but I had a place to put the irrigation waste—in the drain. Where much of the land was white, the alkali seemed to disappear. I got pretty fair yields this year."

"Of course, it will take some time to get the alkali out of the soil, but believe me, the outlook is a lot different than it was a year ago."

Anfin Muri's farm is nearer to the supply canal than Cunningham's and, therefore, a little higher. His crops had not been affected much so far, but he could see the handwriting on the wall.

"The water table was creeping up," he recalls. "I could tell it in several ways. There were a few alkali spots in the lower part of the farm. I noticed, too, that the farmyard seemed spongy



when I drove equipment over it. Then, when I dug a basement I ran smack into a seepage problem.

"Since the drain was built, there's been a change. We've had no basement seepage trouble this year, and the farmyard has lost its sponginess. I guess the drain came just in time to save me a lot of trouble."

Harvey Stoll tells of trying to level one of his fields in order to improve irrigation.

"It just couldn't be done," he says. "The tracks of the tractor would sink and the ground between them would rise so that the carry-all scraper could not operate. The scraper edge couldn't be raised high enough to clear the surface when it came time to empty the carry-all."

He, too, was better off than Cunningham but the seepage problem was such that the lower areas of the farm were "awfully wet" and some of the higher land was getting soaked. Only "alkali weed" grew at places.

"Those lower areas are firm now so that I can operate equipment on them," he notes. "The land I tried to level is firm, too."

C.V. Kimball is one of those close to the Yellowstone River who doubted that there was possibility of drainage. In fact, he had a dike to keep the Yellowstone off his land during high-water periods.

"The water situation here was getting really bad," he explains. "At one place along the dike the water got so deep during the irrigation season that the cattle had difficulty crossing it on their way home from pasture. There were 2 feet of water in the bunkhouse basement, which was on higher ground. Even a field too high to irrigate was seeped and salted.

"I couldn't see any chance for drainage, because I'm right down at the river's edge. I thought I would just hang on as long as possible and then move. I have other land, upland. But, the engineers figured a way out. They led the water away from the river at my place to the main drain that enters the river quite a ways downstream.

"That gave the necessary fall. Now I can farm the whole place. The boggy land has dried out and is firm. Of course, the salted land hasn't fully cleared up yet."

With the main drains built, growers were ready to start building the laterals leading from their

# HAIRY VETCH RESCUES THE CROSS TIMBERS

By LOUIS P. MERRILL

**T**HE STORY of hairy vetch in the sandy, peanut-growing Texas and Oklahoma Cross Timbers area is a chapter in itself in the history of the conservation of soil and water.



**G. F. Wimberley, postmaster of Perrin, Tex., tells J. M. Dickenson, former district supervisor, how hairy vetch increased his oats yield from 15 to 60 bushels. The two piles illustrate the difference.**

Hairy vetch came to the Cross Timbers 9 years ago. That was in the Upper Leon and Brown-Mills Soil Conservation Districts around Rising Star, Tex., where district supervisors believed hairy vetch could be useful in a coordinated soil conservation program if it could be made to grow successfully year after year. The supervisors imported seed from the Pacific Northwest and furnished it at cost to cooperating farmers. They also provided machinery to plant and harvest the vetch.

Success depended on doing the job right. It was important to have proper seedbed preparation, to plant at the right time and depth. It was important, too, to inoculate, to use phosphate in the right amounts, and to use a nurse crop like abuzzi rye.

Field men of the Soil Conservation Service pitched in to help. None of the technicians was more earnest than the late L. K. Gregory, then work unit conservationist at Rising Star. He preached the value and importance of hairy vetch with evangelistic fervor. He recognized the legume

*(Continued on page 254)*

Note:—The author is regional director, Soil Conservation Service, Fort Worth, Tex.





**G. C. Goss, farmer and supervisor of Brown-Mills Soil Conservation District, examines a cluster of the big pecans he raises in his 26-acre orchard. He increases yield and improves quality by using hairy vetch as green manure.**

as the salvation of the Cross Timbers if it could be definitely established.

Gregory gave much of his time to seeing that there was no slip-up in the technical aspects of vetch production. He became known as "Hairy Vetch" Gregory. His splendid work was remembered when he died a year and more ago. The boards of supervisors of the two districts to which he was assigned adopted resolutions mourning his passing and eulogizing him for his outstanding contribution to the cause of soil and water conservation.



**Disking hairy vetch and rye cover crop in 60-acre peach orchard on farm of Doss Alexander of Rising Star, Tex., a Brown-Mills Soil Conservation District cooperator. With Alexander (left) is the late L. K. Gregory, SCS technician who played leading part in establishing hairy vetch as a winter cover crop in the 9-million-acre Cross Timbers problem area.**

Back in 1943, when Gregory and other Soil Conservation Service technicians were working to get hairy vetch established, it had looked as if the highly erodible soil of the Cross Timbers problem area would be gone before a satisfactory cover crop could be grown to tie the land down. The soil of this 9-million-acre area melted like sugar when it rained, and took to the air when the wind blew. A successful legume was a missing link in the coordinated soil conservation program, especially where the soil was left bare all winter, as was the case after the harvest of peanuts.

At first hairy vetch appeared to be a failure like other legumes that had been tried. But technicians like Gregory, and determined farmers under the leadership of their district supervisors, stuck to the problem. Success finally came.

Vetch spread fast in use. When vetch first was tried in a general district program around Rising Star in 1943, only 244 acres were planted. By 1946, acreage had increased to about 30,000 acres and seed production was 30,000 pounds. In 1950 there were 334,374 acres planted to hairy vetch in Texas, 407,651 acres in Oklahoma, the bulk of it in the Cross Timbers. Now the use of hairy vetch has spread far beyond this problem area in the two States. In 1950 the production of hairy vetch seed totaled 10,819,000 pounds in Texas and 9,924,259 pounds in Oklahoma.

As part of a coordinated soil conservation program, hairy vetch is used in combination with other practices, including crop rotation, contour strip cropping, stubble mulching, terraces, and pasture improvement.



Used as a green manure, hairy vetch improves the fertility of the soil and increases the yields of following crops. Peanut yields, for example, have increased as much as 20 bushels per acre, oats as much as 45 bushels.

The stockman, as well as the row-crop farmer and orchardist, is interested in hairy vetch, not only because of its effectiveness in controlling ero-

sion and improving the soil but also because of its value for grazing at a time of year when green forage is at a premium. Hairy vetch is also sometimes used for hay.

And for farmer and stockman there's always that extra dividend which the harvested seed of hairy vetch can bring in.

## IN ONE YEAR, "A FIELD OF BEAUTY AND PROFIT"

By MR. AND MRS. LEONARD KIMBALL

OUR SMALL FARM, 100 acres, is located 1½ miles west of Maud, in Jefferson Township, in the Shelby County (Iowa) Soil Conservation District. Our little story begins back in 1948 when we came to the crossroads, so to speak. Would we go on in the same old rut or would we take a new road by way of a complete soil conservation farm plan? After thinking it over, we went to see the county agent.

He seemed interested in our problem and promptly set about helping us. Nolan Walker, the SCS man in our district, came to our home and helped us work out our plan.

We found that what we needed most was to make our permanent pasture into good grazing land. The upland part of our farm had probably been in cultivation as long as there had been a white man in this territory. The slopes were so badly eroded that one might well call it wasteland. Lespedeza grew only about 3 inches high, scarcely tall enough for a cow to graze. About half the land was bottom land and lay along Otter Creek.

On a farm like ours there wasn't much extra money to try out new ways. We had to make every dollar count, and we couldn't afford to make mistakes. We knew other farmers had made farm planning pay, but could we?

In the fall of 1948, we decided we would try 5 acres of pasture improvement on the hilltop that had been farmed the longest. If it worked there it surely would work on the better parts of our farm.

We were advised to apply 3 tons of lime, 1,000 pounds of rock phosphate, and 400 pounds of 8-8-8 fertilizer.

Walker helped us to stake contour lines and we followed the plan as closely as we could. In the fall we drilled wheat and sowed red clover, timothy, redtop, and lespedeza.

We spent about \$30 per acre on the worn-out piece of land, not counting all the work. We wondered if we would ever see the money again. There may be others who know what we mean by that. We did not have a lot of extra cash lying around and couldn't afford to lose that much money. But we had to wait until harvest to know how it would turn out.

The wheat yield was 25 bushels per acre and had a cash value of \$40 per acre. We had our \$30 back plus \$10 to cover grass seeding and harvest cost. Our wonderful stand of clover and grass we like to count as interest on our investment. In 1 year's time we saw a field that was of little value turned into a field of beauty and profit.

We did not hesitate when the time came to work out the next field. Last year we completed our permanent pasture plans except about 2 acres that require bulldozer work. We will do that this year.

What is the value of our farm plan? Our answer is that we know from year to year what we expect to do, the types of soil we have to work with, and what treatments are necessary to produce the best crops. It is a satisfaction to know that we are building our soil instead of taking away from the value of it.

*(Continued on page 254)*

# A MOUNTAIN CAMP

where BOYS and GIRLS  
learn about  
**Conservation**

By GEORGE SHARPE

**N**ESTLED in the mountains not far from the center of West Virginia is Camp Caesar, Webster County's 4-H Camp. It is in this ideally located retreat that West Virginia holds its con-

Note.—The author is extension soil conservationist, Morgantown, W. Va.



**Two students of the author's class in soil and water conservation consider the use of the abney level. Work included laying out of a field in contour strips, running lines for diversions, and other tasks common to the practical safeguarding of the land.**

**Left.—Firearms always fascinate boys and girls of the mountains. Many learn to shoot at an early age. The youngsters at camp learn about the conservation of human life and wildlife.**

servation camp each spring. The forests come down to the back door while the Gauly River goes roaring by at the front. The most evidences of modernity are the State highway that passes through the camp and a railroad that hauls logs down the river from one of West Virginia's last virgin forests and brings coal back from one of West Virginia's largest coal fields.

This is the spot selected by a group of interested people just 10 years ago for our State's first conservation camp. The initial sponsors were the Agricultural Extension Service of West Virginia University, the Conservation Commission of West Virginia, the Soil Conservation Service, the State Soil Conservation Committee, and the Federal Cartridge Corporation. Each of these agencies was responsible for 40 campers, and each furnished its share of instructors.





**Top.**—Students acquire the lore of running water. They learn how to improve streams, how to develop farm ponds; they learn about fish, the enemies of fish, what fish feed on.

**Left.**—The campfire gatherings afford opportunity to develop talents and acquire poise. The fancy headdresses indicate the group names: Strip Croppers, Forest Rangers, Game Protectors, and Fire Fighters.

**Right.**—Archery is taught by J. H. Branham, one of whose ancestors was an American Indian.



Several sponsors have been added to the list since 1941: The West Virginia Vocational Educational Department, the West Virginia State Garden Clubs, the West Virginia Forest Fire Protective Association, the Monongahela Power Company, the West Virginia Sportsmen's Clubs, the Forest Service, and the West Virginia soil conservation districts.

Who are the young people who attend this well-planned conservation camp? First, there are boys and girls between 15 and 19 years of age. They generally number about 200, two-thirds of them boys and one-third girls. Every county in the State except one was represented in 1951. Campers include 4-H boys and girls, FFA boys, FHA girls, Boy Scouts, Girl Scouts, and boys and girls selected



because of their interest in conservation.

What does this wonderful group of youngsters do at camp? For class purposes, they are divided into 8 groups of 25 each. For campfire and afternoon activities, they are divided into 4 groups known as Fire Fighters, Strip Croppers, Forest Rangers, and Game Protectors. The camp leaders are called "knotheads," and their leader is designated "Chief Top-Knot."

Afternoon activities include such things as archery, camp crafts, the care and use of firearms and fishing tackle, the making of fly rods, and the tying of flies. Then come games and swimming.

At 7 o'clock the whole camp engages in vesper services, which many campers regard as an outstanding feature.

At 8 o'clock comes the campfire program, which begins with a fire-lighting song written especially for this camp.

On Paul Bunyan night—one of the most popular—the "knotheads" reenact mighty Paul, his wife Tiny, Babe the Blue Ox, and other characters found in the classic tales of this legendary woodsman.

During the week every boy and girl attends classes in game management, trapping, forestry management and forest products, forest-fire control and forest recreation, fish management, nature study, soil and water conservation, and youth conservation.

Campers are told the what, why, and how of each conservation program in the State. Most of the teaching is by actual experience. In their study of soil and water conservation they are told what erosion has done to the State and what is being done about it, about the soil conservation district program and how the programs are tied together. Then each boy and girl is taught how to use a hand level and run a contour line. Many of the young people, after such training, help lay out contour lines for their fathers.

The camp has one of the finest youth-camp directors in the country in I. B. "Tubby" Boggs, State boys' club agent. He is assisted by G. H. Overholt, of the West Virginia Forest Fire Protective Association. Ralph H. Quick, chief of the division of education and publicity, Conservation Commission, is camp secretary. Jack Burton, Webster County agricultural agent, represents the 4-H boys and girls of Webster County as host.

If you want a real meal and a look at our future conservationists, drop around to Camp Caesar some day during conservation camp. Many campers claim that Jack serves the best food in the world.

On going home, these boys and girls are especially enjoined to report to the organization that sent them. This report often constitutes one of the outstanding programs for a garden club, a sportsmen's club, or some other group. Some 2,000 boys and girls have attended conservation camp at Camp Caesar already, and many of them now are taking positions of leadership in conservation.

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## DRAINAGE RECLAIMS FARMS

*(Continued from page 249)*

places to the main drains. This would get rid of excess surface water from heavy rains, flooding of creeks, and irrigation waste.

Along with drainage, these farmers also are co-operating with their district for the establishment of complete individual conservation plans.

Included in the plans, besides the necessary laterals, are improvements in irrigation systems and land leveling, so that the irrigation water can be controlled properly. There are also soil-building crop rotations that include grass and legumes, and the use of fertilizers. Before the main drains, there could have been no such individual farm conservation. Land was being ruined, and nothing could be done about it until the seepage problem was solved. Now the area is rapidly on its way back. It was once known for its fertility, and the program is expected to restore it to its former status.

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## IN ONE YEAR

*(Continued from page 251)*

We have come to know the value of plowing under a green manure crop, and of contour cultivation. While improving our permanent pasture, we are at the same time conserving our soil.

Now we have plans under way for a new modern dairy barn. We hope to own a small herd of Guernsey cows that we can handle on our own farm and have enough income to live comfortably.

Our farm planner and our county agent are very understanding and always ready to help us with our problems.



# THE JOB AHEAD

*Excerpts from an address by Dr. Robt. M. Salter, Chief, Soil Conservation Service, at the sixth annual meeting of the National Association of Soil Conservation Districts.*

THE concept of soil conservation has come to mean proper land use, protecting the land against all forms of soil deterioration, rebuilding eroded soil, conserving moisture for crop use, proper agricultural drainage and irrigation where needed, building up soil fertility, and increasing yields and farm income—all at the same time.

It is based on the understanding that you can conserve soil without building it, but you cannot build soil without conserving it.

Modern conservation farming involves increasing soil productivity and increasing standards of farm living for today, tomorrow, and for posterity. It combines the objective of national welfare with better living for the people who work the land. It has come to mean efficient abundant production on a sustained basis.

• • •

There is ample evidence throughout the country, in every county and every soil conservation district, that our soils can be made to produce more abundantly. Studies now being made, aimed at estimating agriculture's maximum production potentials, indicate that average per-acre yields for most crops could be increased from 60 to 75 percent if all of the technology now available could be put to work on the land.

• • •

Throughout the country farmers and ranchers are working together on Extension committees, on Rural Electrification boards, on PMA committees, on credit boards, on advisory grazing boards, on irrigation district boards, and—last but not least—on soil conservation district governing boards.

In my judgment, soil conservation districts represent the best device so far created through which Government can assist farmers without dominating them. Soil conservation districts provide one of our best examples of democracy in action.

• • •

To develop a sound plan for conservation farming, a farmer needs, first, to have a *scientific inventory* of his soil and water resources. Few if any farmers can classify their own soils.

Next, the farmer needs assistance in determining the *best alternative uses and treatment* for the land based on this scientific inventory. He needs help in developing a plan for soil and water management using the best technology adapted to the physical and human resources of the farm and to watershed and other resource problems of the community.

Finally, most farmers need *technical help in putting complex practices into application*. Few farmers have the necessary training to lay out complicated water-control systems and terraces. Many need technical assistance in range management, in establishing improved pastures, in wood-lot management, and other complex practices.

Furnishing this on-farm technical assistance for soil, water, and plant management—aimed at soil protection and improvement, water conservation, and economic production on a sustained basis—is the primary job that the Congress has assigned to the Soil Conservation Service working with and through soil conservation districts.

• • •

Although there may be misunderstandings, I see no necessary duplication between education, technical assistance, and financial assistance in public-supported effort to help farmers get conservation farming into practice.

THE JOB AHEAD involves making all three work harmoniously and more effectively as a team in speeding up the application of technology on the land.

• • •

We can stop the decline of our Nation's precious soil resources. We can build new life into our depleted soils. We can reach levels of production far above those of today. We can meet the pressing demands of a growing and vigorous nation on its agriculture. And we can create in America a shining example of what democracy and science, properly joined, have to offer a free world. This is, for us all, THE JOB AHEAD.



# THE DEATH OF A GREAT CITY

By M. J. KIRSCHNER and  
MALCOLM ORCHARD

THE great River Jamuna emerges from the Himalayas and runs for 200 miles straight south across the Indian plains. Halfway down this stretch ancient India found a crossing for the east-west traffic. The left bank overlooks the swampy right bank. Rolling hills offered sites for forts and castles, and thus the cities which were built in these hills controlled the road into the rich plains farther east. We say cities because many have been built and destroyed. The last dozen or so are known by the name of Delhi. Their ruins are scattered over an area 25 miles long and 10 miles wide.

This scattering is unusual, for broken old cities in the East generally supply the base for the new. Thus, a modern town stands on a hill which is man-made and contains many layers of ruined and forgotten cities. In such a hill one may count as many as 30 layers, the layers representing older and still older civilizations.

Note.—Mr. Kirschner is in charge of Geigy Insecticides, Ltd., and is an amateur archeologist. He is from Munich, Germany, but has spent the last 26 years in the East. Mr. Orchard, a former editor and executive of Farm and Ranch Publishing Co., is an editorial adviser to the Government of India under the Point Four program.

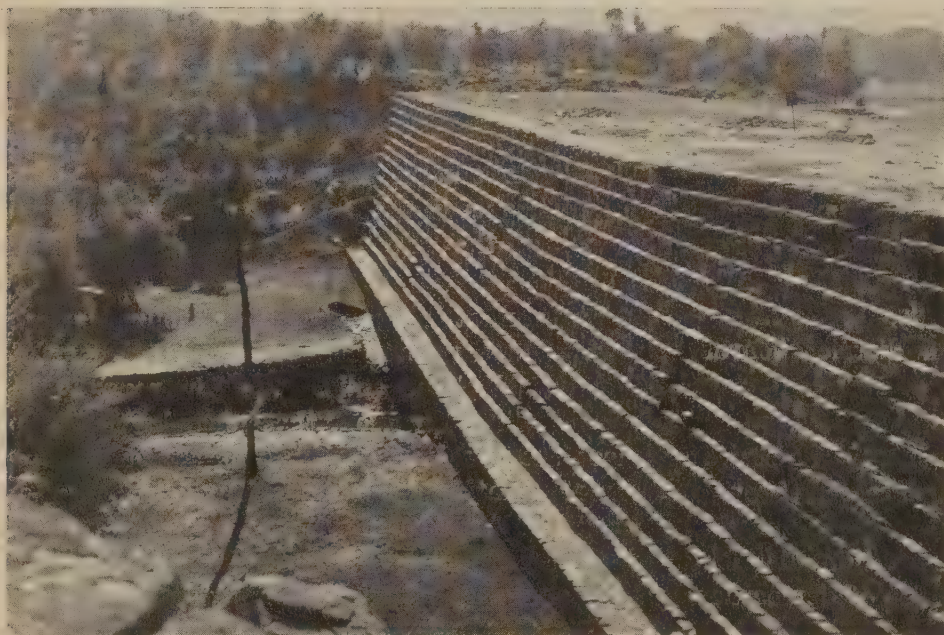


Water outlet, upper side.

In the hot Indian plains people like to live on a hill. The higher the hill the cooler is the breeze fanning them on their roofs at night. In any village you will find the Rich Man's house standing tallest, and if there is a raja's castle, it will be towering above any building in town.

Hills were obviously easier to defend than flat villages. An arrow will carry farther from a high wall down. One also had the advantage of the old bricks and stones from lower ruins which could be used to build the new city and its walls.

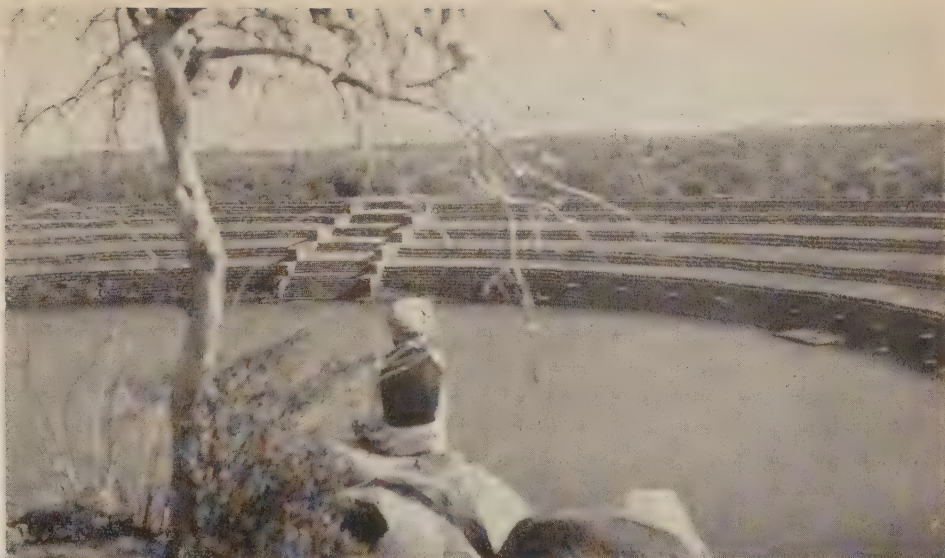
Why then, in the olden days, did rulers dot all these new Delhi cities over the rocky range



The dam is still "a grand monument for the creative mind of ancient India."



Sacred pool of Surajkhund,  
"a relic of the Hindu past."



Stairs descending to water-gate controls.

of hills and the semidesert flat? They were searching for water. Good fresh water, not stinking and brackish, as it is on the Jamuna riverbank.

The Muslims of India built six or seven of these towns. One of these, Tughlaqabad, was built in the course of 2 years, 1321-23. The ruins of this huge city are plain to see today, with enormous walls, water tanks, castles, and other evidences of a large population. The effort was for nought, as it was abandoned 7 years later for the lack of water.

The very oldest of the ancient cities was Indraprastha. The site was later covered by a Muslim fort, and no trace can be found today.

Next comes Surajkhund, 10 miles south. This city was laid out on a wide range of ridges, extending for miles in all directions. Today it lies in utter desolation. No road leads to it. In summer the ridges covered with numerous round boulders are a hell of sun-baked stone and dancing dust devils. In winter a few people come down for picnicking at the sacred tank.

This sacred pool of Surajkhund is a surprise amidst the rocks; a wonderful relic of the Hindu past. One can easily imagine the monumental temples which towered over the two great stairs, the State processions, the dancers, the warriors, and the throb of life in the streets of the city.

The vital water came from a lake 1 mile farther south. And this lake was artificial. It is obvious from the lay-out of the city that the dam of Anangpur was the great idea of its planners.

The name of Anangpur is derived from the kings by the name of Anangpal I and II who are said to have built the dam. Anangpal I lived about 650 A.D., and we may credit him with the great work of creating a lake for the inhabitants of the capital of India. None of the later capitals had such a lake, which is a pity. Modern Delhi and New Delhi would be much easier places to live in if we had King Anangpal's lake preserved for his late descendants of today.

The dam still stands with its spillways and outlets preserved. One still can see the rails for the sliding stone doors of the water gates.





Wheat fields from west side of dam, looking through the ruins of an old temple.

The dam still stands majestic—if you look at it from the valley. The work is still a grand monument for the creative mind of ancient India.

But the lake is gone!

Instead of blue waters, dotted with little islands, we have an expanse of wheat fields, which fill up the lake almost to the rim of the dam. The lake has silted up entirely, and, if we can see some of the details of the outlet and water gates, it is only because the Department of Archeology has done some digging deep down and has exposed the buried glory.

Ancient man who built the dam did not protect the surrounding drainage area from deforestation and subsequent erosion. Townsfolk went out with hatchets to cut a branch or two for boiling the evening pot of rice. In a century or two, a vast expanse of forest disappeared in order to keep the home fires burning. But this practice does not fill the kettle with water. And, when the water is gone, the people go, too. The dwindling lake could not supply enough water. King Anangpal's city was doomed.

The decay was a slow process. The familiar way in which old castles get leaky roofs, the old manner in which the great architecture of the East has fallen to pieces so often, and in so many places, was once again a road to devastation.

In about the year 1030 came the dramatic end. Marauding horsemen from Afghanistan, whose coins are still found in the villages nearby, stormed the city. The walls may have been undermanned and in disrepair, and once more a town was sacked, temples were despoiled and left in ruins to bake under a relentless sun.

The modern twin cities of Delhi stand in an arid semidesert. None of the ridges around will now make a catchment area large enough to fill a lake worth the name. No forests are left anywhere near. The relentless sun is still the same and ready to punish the thoughtless man with the hatchet. And his children's children are still being punished. And the children of his neighbors in the West will suffer too if the grim warning of an ancient city's death isn't understood.

## PLEASE MEET A PUERTO RICAN FARMER

By LUIS OSCAR MARINI, Work Unit  
Conservationist Assigned to the Caribe Soil  
Conservation District, Juana Diaz, P.R.

THE man from whom you will read has lived and farmed, with his family, in our hills—those hills that have made many to feel defeated early in their lives. His name is Virgilio Negrón Ocasio. He looks to be somewhat above the forties, is married with four sons and two daughters. Except two that are absent, the others help in the home and farm. His home is in Barrio Villalba Arriba, Villalba.

Our man, and his family, has come the hard way. About 1930 he got his first 4 acres of land. Then, he had to work outside to get his family living. Being a hard worker and thrifty, he is now owner of 62 acres covering two farms.

In 1949 he got interested in signing cooperative agreements with the Caribe Soil Conservation District. The local agricultural extension agent interested him in getting tech-



nical assistance of SCS through the district. In October 1949 he signed two agreements which included soil conservation plans for 46 acres. It was recently that he bought 16 acres close to the farm where he has his home. In a nearby future the plan of this farm will be amended to include this extra acreage.

After 2 years of relations with SCS and the district, we have asked Mr. Negrón the following questions: Did these relations bring changes to your farming methods? Did you have problems when you began establishing the conservation practices recommended? Have you made your opinion about our relations, the work done, and results obtained?

Here is what the man has answered: "Since then, I am farming on the contour, using crops and other available residues, and practicing recommended crop rotations. I have seeded with molassesgrass 13 acres of pasture out of a total planned acreage of 28.5, have terraced and managed 4.5 acres of coffee from a total of 6, have also managed 7 acres of fruits and ½ acre of woods.

"When I began doing all this I did not find problems; on the contrary, I solved many that I had. After this last 2 years, I can say that, due to our relations, I have worked my farms with more protection and obtained more production. Outside of the increase in crop production, I have had an increase in my cattle with less acres of pasture. In 1949 I had 4 head; now I have 12. All these brought more economic returns and better family living. I have bought home appliances that I could not have before, and I have painted and repaired my home."

This answer of Mr. Negrón shows also what he and his family have done and what they have obtained through conservation farming. They are a proof that this kind of farming is the best that could be practiced in any place—even in a strongly hilly section like that where they live. They are living examples that it could be done, that conservation farming is not only in books.

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*Subscriptions are invited from farmers in soil conservation districts. See rates inside front cover.*

# LAND LEVELING IN CALIFORNIA

By HERB BODDY

OVER the years people have done a lot with the land. They've plowed, seeded, fertilized, watered, and even sweetened it. And now they're at work leveling thousands of acres of the West's crop and pasture lands today.

In the States of California, Oregon, Nevada, Idaho, and Washington more than a quarter-million acres of uneven land have been graded and readied for watering. One-third million more rough acres are in the planning stage.

Almost every day in the Corning, Calif., area you can see rough, hummocky land being smoothed down and put in shape for irrigation. This land is being changed from nearly worthless, often abandoned acreage into high-producing pasture and cropland. So far, some 5,500 acres in the Corning Soil Conservation District alone have been leveled and put in top working order.

There's more to leveling than meets the eye. Not only must the field be graded properly to get good water distribution, but adequate means for getting water on and off the land must be made. A carefully planned lay-out is a must for farmers.

Technicians have surveyed and planned most of the land leveled around Corning. A good share of this land has been leveled by farmers themselves, using their own or district-owned equipment. But private contractors with big equipment are doing more and more leveling work.



Tractor and carry-all leveling land near Corning.

A Service technician goes over the ground with the farmer. This is done to get the lay of the land and to note any special leveling problems.

The first step is to stake out four guide rows. Stakes are set from 50 to 100 feet. In the Corning area they are spaced 50 feet apart. Two of the guide rows are laid out along the widest side of the field. The first row is 30 feet from the boundary; the second, 50 feet from the first one. The other two rows are set at right angles to the first two. You can get this angle in several ways. For example: (a) A square fence row; (b) an orchard tree row; (c) by instrument. All four guide rows are staked 50 feet apart.

After the guide rows are in, the farmer finishes staking the field by sighting along the stakes. It's also his job to mark stakes. The alphabet is used in one direction and numbers in the other. A stake may be marked A-1, U-10, O-10, and so on.

With staking accomplished, it's time for a technician to survey the field. This is done with the farmer acting as rodman.

The farmer places a stadia rod at the base of each stake, in turn. The technician sights on the rod at each stake through his instrument and jots down the reading. When the entire field has been surveyed, the combined readings are used to plot a map of the field. When leveling is done right, no soil is moved on or off the acreage, and a minimum of soil is moved to make grade.

Cuts and fills, charted on the map, are marked on the field stakes. This is often done by the farmer. But in the Corning area, it usually falls to the lot of the contractor. If the contractor understands the markings, the leveling job will proceed speedily and smoothly. That is why it is well to let him do the marking.

It's easy to spot the places that need cutting and filling. The "cuts" are measured from the top of the stake down, and marked in red. "Fills" are measured from the base of the stake up, and marked in blue.

The technician works with the farmer, lays out the field, and sees the job through. He is on the job a good part of the time while the leveling work proceeds. When all the cuts and

fills have been made, the technician checks the new lay of the land with the farmer.

Leveling takes time and calls for lots of hard work. But farmers who have smoothed their rough land say the gains are high in terms of irrigation.

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## FARMING FOR BETTER LIVING

By CARLOS M. CAMPOS DEL TORO

### Soil Conservationist Assigned to the Sur Soil Conservation District

**M**R. Fernando L. Colon Alustiza, a World War II disabled veteran, filed an application for credit at the Farmers Home Administration office in Ponce in September 1947. The young veteran was farming a 4-acre farm under a poor lease contract. The chief aim of the FHA in Ponce County is to help families farm better so that they can live better. The agency's supervised credit program assists those who cannot get adequate land resources and credit assistance elsewhere to get on a solid footing.

The application was duly certified as eligible for assistance by the FHA County Committee, and a Farm Ownership loan was recommended and approved to buy and develop a family-type farm. A loan repayable in 40 years at 4 percent interest was made from Government funds in the amount of \$9,623 to buy 102 acres on Ward Anon, Ponce, P.R., on the coffee section. The farm is located far beyond the facilities of public road, and our client bought an Army-surplus jeep to facilitate transportation of farm products to market.

The family was in a poor economic situation. They owned a dairy cow, 30 laying hens, and 1 heifer, and they started on the farm business during 1948. The farm, with an old rotten house and inadequate farm buildings, was practically abandoned. The new farmer was in urgent need of both credit and technical assistance. The FHA provided sufficient funds to work out a long-time farm plan and the



service of a soil conservationist was required by the FHA supervisor.

The Sur district held a series of educational and training meetings in different communities, and announced free technical assistance and cooperation to the Schuck Tract, which was subdivided in eight family-type farms for veterans.

Farm No. 2 was sold to Mr. Colon and his young family of four. The interest shown by this veteran in the soil conservation program was so marked that we immediately started a soil conservation plan of 5 years to protect land from erosion and get a proper land use on this farm. A diversified program could not be adapted to the farm, due to the fact that it is a coffee farm, land is too steep, and soil conservation practices were urgently needed to stop soil erosion and depletion. A soil conservation survey was made, and a land-use map was developed with specific recommendations as to the use of land capabilities and conservation practices.

Coffee is grown under shade, thus requires woodland management, tree planting, individual terraces, pruning, fertilizing, and liming. A cooperative agreement was developed between this disabled veteran and the Soil Conservation Service in 1949. The agreement has been followed as scheduled and the practices evidenced better farming as shown in the increased yields of coffee per acre.

A newly built concrete house was made with Government funds provided by the FHA. Electricity was provided to the farm during the first year, and now the family is developing better farming and better living. Soil conservation practices brought about production increases from 100 pounds of coffee per acre to about 300 pounds per acre. This provides for a larger cash income which helps our farmer to pay his farm installments ahead of schedule, pay all his operating loans in full, improve health and housing conditions, own good livestock, control erosion, and increase income to assure better farming for better living.

The family team works and shares farm and home responsibilities. The wife, a young and beautiful woman, is a very hard worker, keeps the family vegetable garden, milks the cows, and keeps the house on a very good shape.



Receiving awards in appreciation of services to Oklahoma's soil conservation districts: "Sandy" Saunders, Dave Vandivier, Charles L. Fuson, and Roy E. Hayman.

## FOUR HONORED

By H. M. CHAMBERS

THE supervisors of Oklahoma's soil conservation districts took time out during their annual meeting this year to say "thank you" to four "lay conservationists" who had given outstanding help to the district program.

The four who received appreciation awards were a radio farm reporter, a newspaper editor, a bank association secretary, and a utility company official. L. L. Males of Cheyenne, a district supervisor and chairman of the awards committee, made the presentations.

Recipients were:

O. A. (Sandy) Saunders, farm reporter of Station WKY-TV, Oklahoma City, who helped during the 1951 National Association convention in Oklahoma City, and who has continued to boost the work of districts at every opportunity.

Dave Vandivier, editor of the *Chickasha Express*, who has pioneered the promotion of the

Note.—The author is State conservationist, Soil Conservation Service, Oklahoma City, Okla.

agricultural land-treatment program for flood prevention that is being applied on the watershed of the Washita River. Recently he appeared before a congressional committee in Washington in behalf of more funds for the project.

Charles Fuson, assistant secretary of the Oklahoma Bankers' Association, who has cooperated wholeheartedly with district boards of supervisors and local bankers in sponsoring banker-award meetings where conservation farmers were honored.

Roy E. Hayman, agricultural development engineer with the Public Service Co. of Oklahoma, who has spoken to many groups in the 20-county area served by his company, relative to doing soil conservation "the district way." His straight-from-the-shoulder statements to civic groups have done much to awaken the general public to the need of cooperating with districts.

This makes a total of 38 outstanding Oklahomans to receive soil conservation awards. Claude Thompson, of Ada, president of the association, said: "It's a splendid idea and we're going to keep giving awards just as long as laymen earn them!"

---

**WATERWAY PAYS WAY.**—A low area of 11 acres formerly too wet to produce good hay or be used for crops can now be farmed with the rest of the cropland and produces well, according to Ed Schmidt, New Salem, N. Dak. Schmidt is in the West Morton County Soil Conservation District.

The reason: A waterway was built to drain away the excess water, as part of the farm conservation plan developed for Schmidt's 800 acres.

"That waterway, or drain, more than paid for itself in the last year," Schmidt says. "Eight acres had not been broken previously, and it produced only about 20 tons of hay in 6 years. Poor quality hay, too."

Last year, however, the yield was 25 bushels of wheat per acre. Under the present crop rotation, it will be in corn this year.

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**TENANT URGES LEVELING.**—One tenant farmer in the Carlsbad, N. Mex., area has offered to pay his landlord \$5 more rent per

acre annually if he will undertake land leveling as a conservation practice.

When James C. Wyman, Jr., of Loving purchased an 80-acre farm recently, he immediately applied to the Carlsbad Soil Conservation District for aid in establishing a soil and water conservation program.

About 2 weeks later, Wyman called at the SCS office to find out how the surveys on his farm were progressing. He explained that his tenant figured that leveling the land would save at least \$10 per acre in cost of the labor of irrigating, would conserve water, and undoubtedly would increase yields. The tenant was willing to share this benefit with the landlord, and volunteered to pay an additional \$5 rental if the conservation program was applied immediately. After consulting a Carlsbad banker he decided to go ahead with the work as soon as possible.

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**LAND-JUDGING CONTEST.**—A national contest in land judging and appreciation, conducted along the lines of a livestock-judging contest, will be held in Oklahoma City, May 1 and 2, with every State invited to send a 4-H team, an FFA team, and an adult team of judges.

The contest, first to be held on a national scale, is sponsored by an Oklahoma City radio station, the Oklahoma A. and M. College extension service, State vocational agriculture department, Soil Conservation Service, State Department of Agriculture, and other agricultural agencies and groups.

Land-judging schools have been held in Oklahoma for the past 11 years. The first such school was held in 1941 on the Red Plains Experiment Station at Guthrie, Okla.

Sandy Saunders, WKY farm radio director in Oklahoma City, conceived the idea of holding the land-judging schools on a national basis, and has received fine response from businessmen as well as agricultural workers. Awards will be provided in each of the three separate classes of judging, 4-H, FFA, and adult. Only one team in each division may enter from a county.

He explains the new wrinkle in land judging as a method design which makes it easier for people to look at the land, tell what's the matter with it, learn how to treat it, and keep the soil from washing away.

"The plan was patterned after the livestock people because they had a method of glamorizing the livestock business through their judging contests and shows," says Edd Roberts, extension soil conservationist, who has trained 36,000 people in land-judging and land-appreciation schools in the past 4 years.



Briefly, the system calls for participants to judge four different fields, or pieces of land. They walk about it, examine the contour, topsoil, and slope. They judge the texture, permeability, and other aspects of the soil. They note its depth, its capacity to hold water. They observe the degree of slope, determine the extent of erosion. Finally, they determine the land class, and catalog it according to its capability.

All of these factors are sized up, the contestants make their decisions and check them on sheets of paper with multiple answers, and they are scored, much as a livestock-judging team is scored. The highest scores determine the winners.

"We know they can't become soil scientists or specialists by attending this school or contest," says Roberts, "but it gives the participants an appreciation of the land, what should be done, and what can be done."

Saunders has issued an invitation to all county agents, vocational agriculture teachers, soil conservation workers, veterans teachers, and others to enter the contest, which will be featured on the National Farm and Home Hour broadcast May 3, immediately after the contest closes.

---

**TREE GROWTH SHOWN.**—During a meeting of the Society of American Foresters at Seattle, Wash., 75 foresters visited a Douglas fir thinning job near Granite Falls, Wash. In making advance preparations for the tour, SCS foresters realized that the leading question would be, "Are the residual trees growing as fast, faster, or slower than before thinning?"

Ordinarily an increment borer would be used on the spot to check the ring growth before and after thinning. With a group of 75 people, however, this was out of the question since only a few could see the process and the small increment core would be too fragile to pass around so that all could see and grasp the story it told.

Service technicians solved the problem by taking increment cores from a dozen or so trees which were of all crown classes and which had been subjected to varying intensities of thinning. These cores were then spirally wound with transparent scotch tape and mounted on cardboard sheets. Beside each mounted core was placed information describing the tree from which the core came and the stand in which the tree occurred. The completed sheets were then hung on limb stubs of the trees from which the cores came. This arrangement made it possible for the visiting foresters to see, literally, the reaction of the individual trees to the thinning job.

At the time the increment cores were mounted, little thought was given to the possibility of reusing them. However, it was later discovered that

the mounts have a lasting value. The wrapped cores do not deteriorate rapidly. Six months later they were as fresh looking as when they were extracted. They can be passed around a crowd during group meetings or tours, and in general have proved to be a useful tool in selling forest conservation. Too often people viewing an increment core do not grasp the story which it tells. With full explanations beside the mounted cores, people readily understand the meaning of what they see.

In this instance the distinctive contrast of summer with spring wood made it unnecessary to treat the cores to bring out the annual rings. To adapt the same technique to some other species, it would quite likely be necessary or desirable to stain the cores before wrapping.

—WILLIAM J. LLOYD.

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**FARM-WOODS BUSINESS.**—The value of wood products has long been recognized, but only recently has farm forestry come into prominence. Technically known as silviculture, the practice involves selecting, cutting, and marketing suitable trees, along with employing the best known methods of conservation to insure future yields of timber. In many respects a farm wood lot is like a garden. It requires trimming and thinning if top quality products and continuous crops are to be harvested.

A few months ago, acting on the suggestion of our local forester, I began considering farm forestry as a career. The future for such work can be estimated from the fact that 45 percent of all wooded areas in the Upper Mississippi Valley and Great Lakes drainage region is located on farms.

The first step in my enterprise is contacting owners of timberland and obtaining their cooperation. I was surprised to find these men quite agreeable to my plans, since some had previously refused to bargain with established sawmill operators. The reason, however, is obvious. In selective cutting, only trees that are damaged or those growing too crowded are removed. Wood lots are therefore improved rather than destroyed. Much valuable information on locating available timber and on marking trees for removal is offered free by the Soil Conservation Service.

When a lease is secured and the necessary cash terms agreed on, the actual work begins. Assisted by one helper, I cut, log, and market my timber. With planned recuttings every 5 to 8 years, I have a steady job, with indeed a growing future.

There are literally dozens of communities where such work might profitably be carried on, and the benefits are threefold. The timber owner profits, a reliable, paying job is afforded at least two men (myself and one other), and productive woodlands are insured for future generation.

—WINSTON CLARK.





*Fish-management class at the ninth annual conservation camp, Webster County, W. Va., on small stream running through grounds. It is taught by Harry Van Metre, assistant chief of the division of fish management, and Robert F. Stephens, fish culturist, Conservation Commission of West Virginia. See page 252, "A Mountain Camp Where Boys and Girls Learn About Conservation." Photos used with this article were made by Hermann Postlethwaite.*





**JULY 1952**

# **Soil Conservation**

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

# SOIL CONSERVATION •

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SECRETARY OF AGRICULTURE

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ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE  
WASHINGTON, D. C.

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## WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, under approval (August 6, 1951) of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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### SEED PRODUCTION STRESSED.—

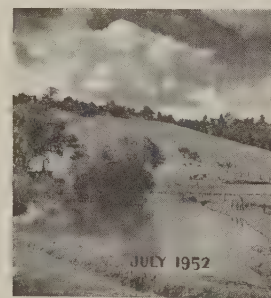
More than 1,000 farmers attended annual conservation information-day programs conducted recently by four northwest Arkansas soil conservation districts. The meetings were held at Bentonville, Green Forest, Huntsville, and Fayetteville. Local firms and organizations cooperated fully in making the programs a success.

Subjects taken up at each of the meetings included grass and legume seed production, PMA payments, bee pollination, seed certification and testing, adjustment and use of combines in harvesting seed, and cleaning of seed.

Main object of the information-day programs this year was to stimulate interest in the production of grass and legume seed in northwest Arkansas.

Taking part in the programs were the Soil Conservation Service, Production and Marketing Administration, county agents,

(Continued on page 285)



**FRONT COVER.**—This pond on the farm of Tom Allen, in the Placer County (Calif.) Soil Conservation District, is one of a great many developed for irrigation purposes in that area. See the article, "Storage Ponds Multiply Value of Range," in this issue. The photographer was Robert B. Branstead.

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## UNITED STATES DEPARTMENT OF AGRICULTURE

FARMERS HOME ADMINISTRATION

PRODUCTION & MARKETING ADMINISTRATION

FEDERAL CROP INSURANCE CORPORATION

SOIL CONSERVATION SERVICE

FOREST SERVICE



### Soil Conservation Objective

"The basic physical  
objective of soil conservation  
activities by Department agencies

*Shall be*

The use of each acre of agricultural  
land within its capabilities and the  
treatment of each acre of agricultural  
land in accordance with its needs for  
protection and improvement."

JOHN P. L. BRIDGES



## SINGLE STATE HEADQUARTERS FOR SIX FARM AGENCIES

**A**BOVE is the signpost of a new day in Agriculture, a day in which all major forces combine their efforts toward the attainment of a common end. It stands at the entrance to the recently opened USDA Building in Alexandria, La., which is the joint State headquarters of a team of major Federal agencies working with landowners and operators on the land.

The building is privately owned, is rented by the Government, and was financed in part from a noninterest-bearing loan advanced by public-spirited citizens.

Under one roof in this efficiently arranged center are the Production and Marketing Administration, the Farmers Home Administra-

tion, the Federal Crop Insurance Corporation, the Southern Forest Experiment Station (Alexandria Branch), the United States Forest Service, and the Soil Conservation Service.

Every foot of the building is occupied. There is a telephone-switchboard operator and receptionist who is employed jointly. In due course, it is hoped to have a number of other common activities, such as mimeographing and the handling of supplies and mail. The advantages of being housed together are already being realized: an increase in efficiency, a saving of money for the Government, a closer working relationship among agencies.

Dedication of this unique State headquarters building—generally regarded as the forerun-

ner of many similar ventures—was marked by floral offerings from various Alexandria business houses and a celebration which included addresses by Senator Allen J. Ellender and Hon. Clarence J. McCormick, Under Secretary of Agriculture.

“This building,” said Senator Ellender, “marks the beginning of a new era of coopera-

tion and coordination among all who have the welfare of the farmer at heart.”

Secretary McCormick spoke of the occasion as “a new and inspiring experience” and referred to the new building as “an appropriate and durable symbol of the cooperation and progress that makes America what it is.”



## DISTRICT PROFILE

McLELLAN  
of  
CALIFORNIA

**R**ODERICK IRVING McLELLAN, president of the California Association of Soil Conservation Districts, does things in a hurry. In 1926 he completed the regular 4-year course at Stanford University in 3. And while there, he was a varsity trackman in the 2-mile and cross-country events.

With the idea of choosing studies that would be of immediate use, he specialized in economics, botany, and entomology. A few years later, still intent on speed, he worked with a brother in pioneering the shipment of flowers by plane, so that they could arrive on the New York market crisp with morning dew.



Hurry, with McLellan, is more than habit. It reflects sureness of purpose, and enthusiasm. And it succeeds by virtue of lean vigor and tested competency.

Behind Roderick is the legend of an adventurous grandsire who came West in the fevered fifties to hunt for gold, and remained to utilize the more dependable wealth of superior climate and soil. McLellan's father first gave attention to dairying, general farming, and horses. Later, higher profits lured him into flower production. During World War I, flowers gave way to the growing of grains. In World War II, they stepped aside for mundane but nutritious cabbage.

The McLellan orchids have become internationally famed. Some of them sped by air to brighten the wedding breakfast of Princess Elizabeth.

Of eight living children, three brothers are actively working in the E. W. McLellan Co., Colma, Calif. Roderick is secretary and in charge of production. He emphasizes that he does not run a nursery; he grows flowers.

"There are people," he notes, "who will spend their last dime for a posy. They need food for the soul as much as food for the stomach."

McLellan always has worked hard. But he never earned a dollar from any other source than the joint family enterprise. At 14, with workers hard to get, he was doing a man's job around the place. His first day out of college, while shoveling manure, he had to duck behind a truck to avoid being seen by gay co-ed friends passing by. But if his labors seemed humble to him then, he was to know eventually the satisfaction of becoming "the gardenia king" and one of the world's foremost growers of orchids and heather. The generation of young ladies he knew as a youth were to wear shoulder corsages which originated at the McLellans by the thousands and scores of thousands.

Roderick McLellan is a veteran in the work of the San Mateo Soil Conservation District. This was the first district in the State, having been organized a dozen years ago. He speaks enthusiastically of "the sincerity and competence of everyone in it."

An idea man, McLellan is widely in demand as a leader. He became a member of his district's board of supervisors in 1943, and in 1947 moved up to the presidency. He has been president of the Rotary Club of Burlingame, a member of the AAA county committee and of the county agricultural war board. He was area president of the Associated Farmers. He was one of two men who founded the California State Florists Association. He belongs to the American Orchids Society, the California Orchids Society, and the Society of American Florists.

Every year he lectures on business methods and cultural practices in floriculture at Ohio State, Cornell, and Illinois University. When Illinois sent him a check to cover expenses he returned it for use on research.

McLellan lives in Hillsborough, where he was born in 1902. There is a little daughter, Lynn, going on four, who undoubtedly is responsible for much of the warmth that lights her father's blue eyes, a special light that not even a thousand-dollar orchid hybrid can quite induce. And in New York is an older daughter, Joan, who is making a career in advertising.

Sixty-two acres are cultivated at Colma, 72 at Half Moon Bay, and 22 at Mount Eden. Except for green manure and cover crops, everything is in flowers. Flowers stay on sometimes as long as 8 years running. Orchids and gardenias are the big items, with acacia, heather, roses, and carnations following. Ten acres are in daffodils and three in camellias. There are 2 acres of orchids under glass, each acre yielding a gross of \$65,000 to \$75,000 a year.

Every bit of soil is essentially man-made. And every bit of introduced soil, peat moss, manure, and other materials is steam-sterilized. There is formaldehyde at strategic points on the floors. Extreme precautions are taken because the entry of a fungous or virus disease could bring tremendous losses. Soil testing and tissue testing are among the advanced techniques.

As production manager McLellan must be farmer, scientist, and efficiency expert. Floriculture is one of the most highly specialized, intricately joined of all agricultural enterprises. Here at Colma I saw management at its best, typified by grading and packing gardenias on

an ingenious continuous-belt assembly line, with 30 workers unerringly guided by a system of colored panels. Here, too, I saw science in meticulous application in the hybridization of orchids, from agar culture to full-blown blossom. And, again, I saw the most modern business practices on display—sound sales psychology in the form of a vast glassed building devoted to potted orchids open to hobbyists, who freely roam, look, and choose, with charts and colors and labels as guides; cleverness also in the design of boxes for shipping potted plants, which makes it almost impossible not to keep them right side up; an enlightened personnel policy which includes incentive system, paid vacations, and group insurance.

The evidences of good management are all around: some 15 hothouse acres equipped with overhead sprinkler irrigation; other acreages fitted with low-level sprinklers; canvas second-ceilings, adjustable for regulation of humidity and circulation and light; golf tees in seven different colors thrust beside plants to indicate days of the week to cut blooms. In one great room I saw 20,000 gardenias; in another, over 10,000 orchids awaiting a holiday. Colma's cool evenings are important to this large flower farm; they are complemented by systems of steam heating and electric lighting. Temperature, moisture, and light are the factors which regulate blooming. McLellan turns on the lights about July 1 and keeps them on until the first of November, at which time they are turned off to get quick blooming.

In California flowers are a major crop. Their value is about \$32,000,000 a year. Except for Government materials, flowers constitute the largest single item shipped by air, and, as pointed out previously, the McLellan brothers are old-timers in this mode of transportation.

One of Rod McLellan's contentions is that there should be suitable credit allowed under the inheritance laws when a farmer dies leaving his place in an improved condition.

Today he pins the future of American agriculture to soil conservation districts. Every acre of productive land should be in a district, he contends; and every district should search out and find its highest potentials of service to the community. Nearly everywhere, he observes, the biggest job of all is education.

—WELLINGTON BRINK

# WATER SHORT BUT MANAGED

By VIRGIL S. BECK

THE people of Costilla County in southern Colorado this year observed the hundredth anniversary of the filing of the first water right in the State. This involved the old San Luis Peoples Ditch, in 1852. The old San Acacio Ditch was constructed about the same time, and the 875-acre farm about 2 miles south of San Acacio which Walter Lyckman operates for his mother was irrigated from an extension of this ditch during the first 2 years of ownership. Since 1912 the farm has been watered through the Sanchez system.

Water has been vital to this area for a whole century. And the conservation and management of water is the key to Lyckman's farming.

The Lyckmans came down from Fort Collins in 1909. Since 1911 Walter and his mother have lived on the farm, with Walter as its manager. Ernest, a younger brother, has his own farm in the vicinity, while Walter operates still another 240 acres 2 miles east of Mesita.

Mrs. Lyckman recalls that their first crops were peas, grain, oats to provide hay for the livestock, and a few potatoes. The ditch company had contracted to get water to the farms in the area in 1911, but failed to do so. As compensation, the farmers were paid \$9 an acre and allowed to keep what few crops they had been able to produce.

Ever conscious of the necessity of making the most efficient use of irrigation water, the Lyckmans started rough leveling of their land with horse-drawn fresnos. In that early day much of the plowing was done by steam-operated custom rigs.

Field peas were the chief reliance. The Lyckmans bought and fed lambs on their feed crops, and usually planted about 15 acres to potatoes. Yields were good no more than 1

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Note.—The author is in the information division, Soil Conservation Service, Albuquerque, N. Mex.





This windbreak—1,750 trees—was planted on the south side of Lyckman's farm in 1935. Many of the trees now are 40 feet high, giving the farmstead protection from the strong winds.



Walter Lyckman, left, and his brother, Ernest.

year in 5, as the leaves were prone to suffer from blight and turn yellow.

In 1928, it was discovered that the psyllid insect was causing the potato blight over much of Colorado. Spraying with lime and sulphur was invoked, and potato yields generally have been good since.

As yields improved, the Lyckmans put in about 50 acres of potatoes and quit their lamb-feeding program.

The mounds of huge kangaroo rats have made irrigation difficult. Gradually, however, Walter Lyckman improved his land by leveling with drags and floats.

When the Sanchez Soil Conservation District was organized in 1947, Ernest Lyckman became secretary-treasurer, a position he still holds. He was the fourth farmer to sign a cooperative agreement.

Soil Conservation Service technicians helped Lyckman to plan a conservation program. His farm has 758 acres of irrigated cropland and 72 acres in dry pasture.

Lyckman started survey-leveling immediately, renting district machinery, and completed 90 acres in the fall of 1947. Since then 650 acres have been leveled, only 105 acres still remaining to be treated. Some of the leveling was done by contract, at a cost of \$70 per acre. Lyckman considered this rather expensive, and as a consequence he bought his own equipment and began doing the work himself.

Irrigation ditches have been relocated for more efficient use of water, and 100 acres have been subsoiled to give better water penetration.



The water supply was short in 1951, crops were below average. But on 65 to 70 acres of alfalfa Lyckman produced some 2 tons to the acre. On 75 to 85 acres of potatoes he got 300 sacks to the acre. Oats and peas were grown on 220 acres, while 125 acres were planted as an experiment to Moravian barley which is used in malting. The barley experiment proved successful, and barley has been adopted as a cash crop. The rest of the land was not cultivated because of the water shortage.

Lyckman now has a flock of 150 ewes which consume all his feed crops and clover. All barnyard manure is used on the potato fields, and additional quantities are purchased. In addition, 500 pounds of commercial fertilizer to the acre are applied.

In his rotations, Lyckman seeds a field to grain and clover and then uses it as a clover pasture for sheep the second year. The clover then is plowed under as a green-manure crop to improve soil fertility. Potatoes are planted the third year. Fields are kept in grain 1 to 2 years, depending on conditions.

In 1935 a windbreak of 1,750 trees was planted along the south side of the farmstead as protection from the prevailing southwesterly winds. They are now 40 to 50 feet tall. They include Russian-olive, Chinese and American elms, honey locust, box elder, and green ash.

In his efforts to make the most efficient use of water, Walter Lyckman, who is mechanically inclined, has put together a sort of disker and leveler with which he builds his irrigation borders. The machine has six disks, three on each side with the width of the desired ridge between. The disks are set at angles of about 45 degrees so they can turn up the dirt for the irrigation border ridge. Immediately behind the disks are two small leveling blades. As the disks throw up the ridge, the levelers fill in the furrows made by the disks and the borders are completed in a single operation.

Lyckman makes his borders 17 feet wide and a quarter mile long. After long experimentation, he has found that a 3.5-cubic-foot-per-second head of water flowing for exactly 30 minutes puts 4 acre-inches of water on the border, which he has determined to be the needed amount for proper irrigation.

In still another effort to improve the water situation, Lyckman tried drilling two wells last year for supplemental irrigation. This he found both expensive and well-nigh futile. One of the wells sanded up and clogged the pump.

Despite his battle with the century-old water problem, Lyckman finds time to play. He and his brother own their own planes and are experienced flyers. When farm work is not too pressing, they hop away in their planes for a few days of deep-sea fishing in the Gulf of Lower California.

---

**TIME TO PRACTICE.**—J. B. Litchfield, work unit conservationist in the Roanoke-Chowan (N. C.) Soil Conservation District, got an application from Mrs. Ruth Storey for district assistance and helped her work out a plan for her farm. As she signed the agreement, she said, "Parker (her son) has won the soil conservation speaking contest at Jackson High School for the past 2 years; I think it's about time for us to start putting into practice some of the things he's been talking about."

---

**DISTRICT SEAL.**—Supervisors of the Ogeechee River Soil Conservation District in Georgia have adopted a district seal similar to a notary seal. The seal, which bears the name of the district and date of organization (1940), will be used on all copies of the signature sheet of the district farm plans.



**MORE PRODUCTION.**—Edward Gardner, Stephen-town, Rensselaer County, N. Y., dairy farmer, is doing his part to meet the demand for increased crop production by establishing strip cropping. Last year, he says, strip cropping in a 17-acre field boosted his corn yield nearly 100 percent—from 75 to almost 150 bushels per acre. In addition he says the strips are saving 150 yards of topsoil heretofore lost annually through erosion.





George E. Lane.

## DISTRICT PROFILE

GEORGE E. LANE  
of  
SOUTH DAKOTA

George E. Lane retires after 14 years as an elected supervisor of the Brown-Marshall Soil Conservation District. He was born November 4, 1884 at Monango, N. Dak. He received his education in the public schools of Ellendale, N. Dak., and his higher education at Ellendale Normal. In 1902 he started his banking career in an Ellendale bank, and in 1922 came to Hecla, S. Dak., to take over the presidency of the First National Bank, a position he still holds.

Although he is not actively engaged in farming operations, there is no one more firmly convinced of the value of practicing good conservation than George E. Lane. He has been an elected member of the board since its inception and during all of that time has served as treasurer. He had seen poor management of

the fertile sandy loam soils of his community and its results during the drought and the wind erosion of the 1930's. He was one of the first in the Nation to see the value of soil conservation districts and to promote one for the wind-eroded area of Brown and Marshall Counties.

The Brown-Marshall Soil Conservation District was the first district organized in South Dakota and the thirteenth in the United States; and it has contributed much to soil rehabilitation of this area. There have been 920 complete conservation farm plans prepared between the cooperators and the district.

Being a banker all his adult life, Lane looks at the value of soil conservation from a little different slant than does the average person:

"Soil erosion costs the people of the United States billions of dollars a year in wasted land, declining crop yields, railroad and highway damage, flood losses, silting of reservoirs built for water supply and power. Everyone pays part of the cost. It is not just the farmer's problem, it is the problem of the businessman as well. Crop yields decline as erosion progresses. Eroded range lands feed fewer livestock. Abandonment of fields and finally of farms is the eventual result of unchecked erosion. Farm incomes, buying power, and living standards are lowered. People are forced to move away. Trade is lost to towns and cities dependent on a profitable agriculture. When a farm is eroded out of production, it also stops yielding tax revenues for the support of schools, roads, and other public services. Churches and orphanages also suffer. The burden of the remaining productive land becomes heavier."

During the past 14 years, Lane has given unselfishly of his time, effort, and counsel in guiding and promoting the work of the Brown-Marshall Soil Conservation District. He has watched farming methods improve, through the assistance made available through the district. It has been through his efforts that thousands of acres of trees have been planted, crops improved through rotations, grasses and legumes planted, land leveled, and numerous other soil conservation practices carried out. All of these have improved farming operations, increased farm incomes, and conserved soil for future generations.

—GEORGE H. COULTER.



# SCIENCE TACKLES MOUNTAIN SLOPES

By BERNHARD A. ROTH

District and technicians saved slopes such as these in Belknap recreation area.

**T**HERE are quite a number of things you wouldn't be thinking of schussing down the Tiger Trail with the northeast wind spraying snow against your skiing goggles. You'd be busy steeling your nerve for a gelundesprung off the terrace halfway down, or a flashy Christy away toward Phelps Slope. You might even be wondering if the gang was watching for a whopping sitzmark—they warned you to strap an extra pair of skis to the seat of your pants.

It's a safe bet you wouldn't be thinking about *soil conservation* while rocketing down a long mountainside in New Hampshire. The business of fighting gullies, floods, and agricultural disasters would seem to have little connection with hissing boards and flapping parkas on a ski slope at the height of the season. But here is what happened at the famous Belknap recreation area.

Belknap is a beautiful natural bowl of fun for summer and winter outdoor sportspeople. Enclosing the "bowl" are half a dozen 2,000-foot mountains with picnic spots and trout rills, and miles of trails for hiking. Skiers in winter

ride the 3,200-foot chair lift through subarctic sunlight. From the top they can see the snowy peaks of the Presidential Range lifting their heads above the far shores of Lake Winnepesaukee.

Since 1937, when the Civilian Conservation Corps completed this million-dollar playground and turned it over to the county, Belknap has drawn more and more "snowbirds" from the big cities of the Northeast. Recent years, on week ends when the snow base was good, have seen the 3,000-car parking lots packed to capacity, the huge Alpine-style lodge filled to overflowing, and the trails and jumps alive with fast, skiing action.

To take care of the crowds, several new slopes were opened. Trails were widened and lengthened. In the process, bulldozers knocked down trees, dug out rocks, pushed stumps aside, and sometimes scalped off the tough mountain grass and shrubs.

Skiers liked the results. They found the broad, unobstructed chutes perfect for the slalom or just straight, downhill, speed runs. Everything was fine until spring.

One wet morning, however, Manager Fritzie

Note.—The author is with the information division, Soil Conservation Service, Upper Darby, Pa.



Baer looked up at a new slope and was disturbed to see scars in the earth exactly like those he had seen on run-down and abandoned farm land. Waters from thawed snow and ice were ripping through the scarred places. Baer walked up the steep trail and noticed that raw spots started wherever the cover vegetation had been damaged. The little gullies were only a few inches deep, but Baer was enough of a conservationist to know they'd get deeper fast. A torrential August cloudburst might send half the slope down onto the parking lot below.

Baer sought help from the soil conservation district headquarters in Laconia. District supervisors were all local farmers, with a stake in Belknap's natural beauty and the brisk trade visitors brought to the stores, restaurants, and tourist homes. Supervisors took up the problem with technicians of the Soil Conservation Service.

and shoulders of the terraces were scooped out along the level, contour lines established by the engineers.

One final task remained—getting something to grow again on the naked soil. This was quite an undertaking on poor, terrifically steep ground. To protect the soil, a tough sod was needed. It would have to resist the attacks of erosion and the steady pounding of thousands of hikers, climbers, and skiers year after year.

The technicians utilized experience gained while renovating rugged old pastures nearby. They cultivated a bed about 2 inches deep and sprinkled a heavy seed mixture, 52 pounds of grass and legumes per acre. They added 500 pounds of fertilizer and 2 tons of pulverized limestone, and firmed the soil with heavy field rollers. They left Belknap with fingers crossed, and a silent prayer that a storm wouldn't cancel off their work before the seeds sprouted.

There's a diversion terrace here which skiers use for crossing and turning.



For many days activities on Belknap's 800 wooded acres and clearings resembled those to be seen on many a conservation farm.

SCS engineers estimated the amounts of water that might pour over the long, bare slopes in summer rains and spring runoffs and the speed and volume that might occur anywhere along trails that frequently pitched down at sharp angles. They drew designs for diversion terraces that would carry water away from critical areas and lead it harmlessly to nearby brook beds or protected woodland outlets.

Farmers of the district loaned bulldozers, graders, and hand tools for the job. Channels

Belknap has gone through one successful skiing season since then. And Fritzie Baer has looked out upon his slopes in rain, snow, and sunshine and observed with satisfaction that they're right where they belong—thanks to the science of soil and water conservation!

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**12 PRIZES IN ONE.**—What can be a more appropriate award for achievement in soil conservation than a year's subscription to SOIL CONSERVATION Magazine? Place subscriptions with Superintendent of Documents, Government Printing Office, Washington 25, D. C., at \$1.25.



Dam of John D'Agostini. Over the top goes a county road. Water capacity is 500 acre-feet.

## STORAGE PONDS MULTIPLY VALUE OF RANGE

By HERB BODDY

**W**ATER "strikes" in the form of scientifically planned irrigation ponds are dotting the scene of the old Gold Rush diggings around Placerville, Calif., today.

Some 151 ponds, storing more than 6,250 acre-feet of water, have been constructed in the Central El Dorado Soil Conservation District, and many more are planned.

Note.—The author is a member of the information division, Soil Conservation Service, Portland, Oreg.

Most of the earth-fill reservoirs were built to meet long-time water shortages and to irrigate native dry-land range. But ponds are handy, too, for a cool summer plunge or a bit of fishing.

Farmers like the way storage ponds and dams have turned low-producing dry lands into lush, green forage. The irrigation water has increased farm-land values; land under irrigation is worth five times as much as dry land of the same class.

Even farmers who use irrigation-district water find it pays to own a pond or two. The irrigation district supplies water for only 4 months out of the year; while runoff-fed ponds



can be tapped from early spring to late fall.

At first glance, an upland pond looks simple to build. But there is a lot more to dam building than meets the eye. You can try to dam up a small canyon or hollow by piling up dirt, but the odds are your dam won't stay.

To be on the safe side, says R. E. (Doc) Mason, work group engineer on the Placerville staff of the Soil Conservation Service, dams should be planned properly. The farmer and his contractor should go over the plans together. It is important to pick the right season to begin work. In rainy seasons costs are usually much higher and there is always a chance of floods. In the dry summer months the cost of watering the fill for proper construction may be too high.

In the El Dorado area, laying a good foundation for a dam comes well ahead of the fill. Because stream beds have been placer-mined, it is necessary to strip them down to an impervious base to avoid excessive seepage. Bedrock in some areas is so fractured that much seepage can be expected.

Mason, who has laid out many irrigation dams and ponds for farmers in the Central El



Outlet pipe of Robert Jameson dam, ready for welding of reinforcing steel. Later the trench was filled with concrete. The dam provided a storage capacity of 120 acre-feet.



SCS engineer and Ted Heusner, rancher, go over the plans for dam at Shingle Springs, in El Dorado County. Capacity is 185 acre-feet of water.

Dorado, Sierra Valley, Nevada County, Mono County, and Placer County Soil Conservation Districts, gives these tips on dams:

1. Weigh the cost of building one against the gains you will make from the extra irrigation water. Be sure you will gain by building one.
2. It takes 4 acre-feet of stored water to irrigate an acre of pasture for a season.
3. A good dam site is the first keystone. Dams must have a good foundation to hold water. The amount of leakage you get depends largely on what the base soil is like.

L. D. Stodick, whose ranch is near Placerville, used to run cattle on Forest Service land. He was lucky if his stock came back from summer range without losing weight. Nearly every year he lost a number of head on the rented range, and most years he marketed his cattle in the spring. The upland dam he put in 3 years ago solved most of his problems. He now keeps his cattle on irrigated pasture nearly the year around. That means he can graze his stock longer, fatten them more, and get top beef prices. About 200 acres of improved pastures are now watered from Stodick's storage pond and he plans to irrigate another 100 acres this year.

L. W. Veerkamp, who heads the Central El Dorado District board, has one of the best orchards in the Gold Hill section. He said that

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# AMERICA'S CAPACITY TO PRODUCE FOOD

Our future capacity to produce will depend in a large measure on the way we manage our soil resources. Advances in other fields such as crop improvement, improved pest control, and better livestock management will contribute, too.

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During recent years soil research has brought forth much new knowledge about the causes of soil deterioration and methods for combating it. For example, we have found that some soils, although naturally infertile, can be made highly productive. Many fields once considered worn out or useless can be made to yield abundantly. Some already are.

We have also found that naturally fertile soils that have lost productivity through use and abuse often can be rejuvenated. Already, productivity is on the "come-back" on many farms where yields were falling off because of declining soil fertility.

As a result of these findings over the years there has gradually evolved a changing concept of soil conservation. The modern concept has come to mean applying the necessary practices on a farm to increase production and to build up soil productivity, both at the same time. It means making soils yield abundantly year in and year out for an indefinite period. It means rebuilding strength in the land.

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Good practices used in the right combination create interactions that give an *added boost* to production. One good practice may be beneficial, but the advantages often pyramid when several good ones are used in the right combination. The reaction is much the same as hybrid vigor in corn.

I can best describe this principle with an illustration that I think you Iowa farmers will appreciate. In the South, corn yields always have been low. Until recently they never averaged more than 20 bushels per acre. For years farmers and scientists tried one new practice after another. But they couldn't get corn

*Excerpts from an address by Dr. Robt. M. Salter, Chief, Soil Conservation Service, at the National Farm Institute, Des Moines, Iowa.*

yields to go up much. They tried corn hybrids. They tried using more fertilizer. They tried increasing the stand. They tried first one thing and then another, but without much luck.

In 1944, they changed their approach. Instead of testing first one practice, and then another, and then still another—they tried several of them all at once. They tried *combinations of practices* and found some that hit the "jackpot." Corn yields jumped from 20 bushels to 80 bushels per acre.

During the last 5 years thousands of southern farmers have started using these new combinations of practices. Consequently, average corn yields have been *doubled* in some Southern States.

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There is plenty of evidence throughout the country that we haven't yet put into use all of the best combinations. Several studies aimed at estimating agriculture's *maximum* production capacity are under way. I have examined preliminary results of some. They indicate that with the best combinations of known practices put into use on all farms production could be increased from 60 to 75 percent. The studies indicate, for instance, that average *corn* and cotton yields in the United States could be increased about 75 percent. The potential for small grain and soybeans doesn't appear to be quite that high, but for hay and pasture it appears that we could double our forage production through grassland improvement.

There are two points I want to make about this maximum *potential* capacity to produce. First, it is based on present knowledge. It does not take into account new technology to come from future research. Second, the potentials are for ideal situations. They assume the application of the best known combinations of



practices for each farm and for each crop, and that every farmer would give top-level management to each acre of his land.

Obviously, we will never realize this ideal, yet it is completely within the realm of practicality to expand greatly our capacity to produce by making better use of technology now available. This is demonstrated by the difference between what the average farmer is doing and what the best farmers are doing. The best farmers in all parts of the country are making their soils produce about double what the average farmer is producing.

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Also, there are sizable opportunities for expanding our future capacity to produce by bringing idle or unproductive land into use.

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To bring sizable areas of *new* land into agricultural production would involve considerable public expenditure. I don't intend to discuss that phase of the problem this morning, except to point out that in considering America's capacity to produce food we cannot overlook the possibilities of bringing new land into production.

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Most systems of farming that give efficient production on a sustained basis need to be planned ahead for several years. Many of the best practice combinations give the greatest returns over a period of years—say 5 to 10 years. One of the first requirements for a more rapid expansion of our capacity to produce food is to make possible such forward planning by *more* farm families.

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In a democracy we don't force farmers to do all these things. We don't use devices that sacrifice individual freedom. Instead, we rely on (1) education, (2) technical assistance, and (3) financial assistance to *help* farmers with this job.

Farm prices come into the picture, too. If prices are too low, the farmer doesn't have the cash to finance the practices needed to put his plan into operation, or the materials to keep it going—such materials as fertilizer, legume seed, weed killers, and others. Farmers cannot carry out well-rounded plans without adequate prices.

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While adequate prices are necessary to keep a plan in operation, many farmers need *financial assistance* in order to put conservation farming into practice. Applying a basic plan often requires considerable capital investment. Moreover, shifts to conservation farming often require *temporary* economic sacrifices since some time may be needed for returns from the new system to equal and exceed returns from the old system.

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The development of forms of public and private credit better geared to the repayment potentials of conservation farming would aid materially on many farms. On the other hand, on some farms in most areas, and on most farms in some areas, the financial requirements exceed available resources. It may require many years for these farmers to pull themselves up by their own bootstraps. I doubt if the Nation can afford to wait that long and permit our soil resources to further deteriorate in the process. I am convinced that the urgency of the national interest justifies doing everything possible to help farmers get more of our improved technology into use on the land.

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The opportunities are *real*. Their achievement is a challenge to all farmers because fundamentally the responsibility rests with every individual farmer in the United States. But, for him to get the job done—and done soon enough—it is imperative that he have the best possible information, guidance, and assistance. As Chief of the Soil Conservation Service, I am making it my primary concern to speed up the rate at which farmers get the sound on-site technical assistance in the field of soil, water, and crop management that they need to maintain and build up America's capacity to produce.

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**SCS EMPLOYEE DECORATED.**—Captain Dirk van der Voet, 31, SCS soil scientist with headquarters at Concord, N. H., has been awarded the Bronze Star Medal with "V" device for heroic achievement in helping to halt a communist barrage in Korea.

Captain van der Voet served in World War II from 1942 to 1946, completed his education in agriculture at the University of New Hampshire in 1948, and joined the SCS in July of that year. He was recalled to active duty in August 1950.



# CASCADE LOTUS, PROMISING NEW LEGUME



Portrait of an important new plant, Cascade Lotus.

By R. B. BRANSTEAD

**D**AIRY farmers along the west coast of Oregon and Washington got an answer this year to one of their most vexing problems: What to do with land that is too wet, too dry, too shallow, or too acid for alfalfa or clover. The answer is Cascade Lotus, a new variety of broad-leaved birdsfoot trefoil developed jointly by Soil Conservation Service nursery scientists and the Washington State College agricultural experiment station.

The announcement that limited supplies of Cascade Lotus seed would be on the market in 1952 climaxed nearly 15 years of searching, selecting, and testing by A. L. Hafenrichter, in charge of Service nursery work in the far West; W. E. Chapin, manager of the Bellingham, Wash., nursery; and A. G. Law, Washington State College grass-legume authority.

These three men realized many years ago that a different legume, such as trefoil, was vitally needed for use on soils that would not support good stands of alfalfa or clover. There are extensive areas of such soils along the

Oregon-Washington coast. Numerous farmers in years past had experimented with the common, narrow-leaved varieties of birdsfoot trefoil, but with generally poor results. The greatest difficulty seemed to be in getting a stand. The trefoils then on the market were extremely weak in the seedling stage and offered little, if any, competition to weeds. Stands were extremely difficult to establish and seldom stayed in long when competition developed from other plants.

Hafenrichter, Law, and Chapin began hunting for a more vigorous strain of birdsfoot trefoil in 1938. They were confident that if a strain could be found that would show more "fight" farmers would welcome it.

They collected seed from all available strains and began a lengthy testing and selection program at the soil conservation nursery at Bellingham. The collection included many kinds of birdsfoot trefoil (*Lotus corniculatus*). As the tests went on, they discovered that three lots of an introduction from Italy with the unromantic title of FC 20,153 appeared to have the qualities they were after. These three lots

Note.—The author is information and editorial specialist, Soil Conservation Service, Portland, Oreg.



produced as much forage on a 5-year average as the best varieties of alfalfa.

Interest centered on some outstanding plants of FC 20,153. As superior plants were selected, they were moved to an isolated spot where they could not be contaminated by weaker strains. Here they were allowed to cross-pollinate and produce seed.

This seed was grown in three places in western Washington; Bellingham, Puyallup, and Vancouver, in a scientific test with other leading strains of Lotus. The Italian Lotus outperformed them all.

When enough seed was available, field trials were made throughout western Washington for three successive years to see if the plant would live up to its expectations on the farm. Results were impressive. The cross from selected plants was named Cascade Lotus and accepted and released to selected growers by the Washington State Crop Improvement Association in 1949.

Cascade Lotus is superior to other strains of trefoil in many ways that will be welcomed by farmers who have struggled to grow the common varieties in the past. The seedlings are more vigorous. They give far better competition to weeds and grasses and are able to hold their own nicely in a mixed stand. Cascade Lotus produces especially well when grown in alternate rows with orchardgrass. At Bellingham it yielded 2.31 tons per acre when grown with grass. There is more recovery after the first hay cutting and more summer grazing on nonirrigated pastures.

Although Cascade Lotus can be used on the poorer and more acid soils where other legumes will not thrive, still there is a limit to where it will grow. It cannot survive in swamplands or on peat, nor will it grow on soils that are extremely droughty. It can stand occasional flooding, but prolonged immersion for several weeks will kill it. It has not yet been proved winter-hardy east of the Cascade Range in Washington and Oregon.

The biggest draw-back to birdsfoot trefoil in the past has been the difficulty of establishing a stand. Cascade is much more dependable in this respect. It needs a firm seedbed, as weed-free as possible, that has been well packed to bring the moisture up to the seed. Seeds

are planted not over half an inch deep. Rolling the seedbed after seeding frequently proved the difference during tests between success and failure in getting a stand started.

Recommendations of the Bellingham nursery are to use 4 pounds of Cascade Lotus with 4 pounds of orchardgrass or 6 pounds of Alta fescue per acre. Cascade must be inoculated with the right bacterial culture for the *Lotus corniculatus* family.

Fertilizing with superphosphate at 150 to 200 pounds per acre usually pays. Where soils are badly run-down, a faster and better seeding can be established by using 100 pounds of ammonium nitrate or 150 pounds of ammonium sulfate per acre at seeding time.

The tender-leafed, yellow-flowered Lotus has excellent forage qualities. It is readily eaten and liked by all kinds of livestock and has a feed value close to alfalfa. It is highly nutritious as hay or silage in a grass mixture. Also, it is considered by many livestock men to have less tendency to bloat than other legumes. Lotus also has a favorable effect on the keeping qualities and vitamin A content of milk.

Seed of Cascade Lotus is now being increased in western Washington under certification by

(Continued on page 285)



The new legume in a good stand on land unsuited to alfalfa or clover.



# CREEK INDIAN LEADS HIS COUNTY



Strip cropping, terracing, and contour farming played an important part in the conservation plan.

By EVAN L. FLORY

**G**EORGE LONG, a Creek Indian, received the 1951 Bankers Award for Hughes County for soil conservation achievement at a meeting of the Oklahoma Bankers Association held at Calvin, Okla., January 8, 1952. The award was presented to Long in recognition of the outstanding job of soil conservation carried out on his allotment. This farm is leased to Clell Eddy under a verbal lease on a crop-share basis. Long was instrumental in starting the program and in seeing it carried out. From the beginning he furnished his share of fertilizer and soil-improvement money.

Eighty-five of the one hundred sixty acres rented to Eddy are in cultivation. In the 4-year period, 1944-47, the allotment returned to Long an average of \$400 a year. The Eddy family was barely existing. Corn and peanuts, the principal crops, were planted in straight rows up and down hill with no conservation practices being observed. Average yields were running 15 bushels of corn and 20 bushels of peanuts per acre, and they were getting lower. In the



George and Betty Long proudly display award.

Note.—The author is chief, branch of soil conservation, Bureau of Indian Affairs, Washington, D. C.



fall of 1947, Long and Eddy, after consultation with the Wewoka Indian Soil and Moisture Conservation Work Unit, decided to carry out a conservation plan.

After surveys were made, it was determined that the most pressing need was to stop sheet and gully erosion. A terrace system was designed and staked by the technicians. Long paid the cost of construction not covered by PMA payment. Eddy planted his crops on the contour in 1948 and fertilized in accordance with recommendations of the technicians. Check plots without fertilizer were left in order to compare results.

When the crops were harvested in the fall, Long received \$1,100 for his share of the crop. After deducting the \$240 he had paid for terrace construction, he received \$460 more rent than in 1947.

Conservation measures were continued in 1949, with hairy vetch being planted in the fall on a part of the land as a soil-building and seed crop. Since breaking from native sod about 40 years ago, the land had never had a protective cover in the winter, and no legume of any kind had been grown. Despite the fact that no combine was available to harvest the vetch seed at the proper time and much shattering occurred before harvest, it yielded 200 pounds of seed per acre, with a net profit of \$20 per acre. Long's share of the crops in 1949 was \$1,485. The year 1950 was a very poor crop year in Hughes County, but the farm paid Long \$900.

By 1951 Eddy was convinced of the advantages of conservation farming. Terraces and contour farming had stopped sheet and gully erosion and had added 15 acres to the cultivated land by healing gullies, preventing overhead water from washing out seed and crops, and conserving moisture. Eddy was saved labor and money in not having to replant crops several times because of their having been washed out, silted over, or drowned out by heavy runoff and erosion. Application of fertilizer at planting time increased crop yields materially, and side dressing had boosted these yields still further. The use of vetch had further increased crop yields by 5 bushels per acre and had made the soil easier to plow and the crops easier to cultivate.

In 1951 Eddy's yield of peanuts was a little over 30 bushels per acre, against the county average of 15 bushels per acre. His corn yield was 50 bushels per acre, compared with a county average of 17 bushels per acre. For the 1951 crop year, Eddy paid the owners \$1,500 in rent.

Eddy is no longer a "poor share cropper," struggling to make ends meet. He has good farm tools and equipment, and his family is free from want. When he first rented the farm he says he would not have paid \$25 per acre. This fall he tried to buy it for \$100 per acre. Naturally, Long refused to sell and proposed that Eddy rent additional land which Long owned with other heirs. The proposal, however, specified that the owners would terrace the land to be farmed in accordance with a conservation plan.

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**GAINS.**—Kermit Blessum, of Rugby, N. Dak., a member of the board of supervisors of the Pierce County Soil Conservation District, has made as much money from hay and seed production as from a similar acreage in cash crop. Furthermore, soil fertility is being built up.

Blessum keeps 300 acres seeded to grass-legume, straight grass, or straight alfalfa. Some of this land is used as pasture to augment native pasture, some produces hay and seed. Blessum has sold some hay and seed, but intends to use most of what he produces at home. He keeps on hand more than a year's hay supply.

His custom is to seed 6 pounds of crested wheatgrass and 4 pounds of alfalfa seed per acre for hay, and 10 pounds of crested wheatgrass per acre for pasture.

The use of grass and legume in the crop rotation is part of the farm conservation plan developed in 1947 with the aid of the Soil Conservation Service. The first field was seeded that spring.

Besides using grass-legume, he also practices a 2-year crop rotation, alternating small grain and either corn or fallow. Part of the farm is sandy and subject to blowing. Stubble-mulch farming is practiced on all cropland. Cornland is double-cultivated instead of plowed. There are waterways to dispose of excess water, and there is also a field shelterbelt. PMA helped with the conservation plan.

The first grass-legume mixture was seeded in 1948 and plowed last spring. It was fallowed in 1950 and will be seeded to small grain this year. This will be Blessum's first chance to see what the effect on the crop will be. He already reports that the soil is more mellow.

# TECHNICIANS FLY TO SPEED WORK

By GUNNAR M. BRUNE

EARLY last year the Upper Mississippi Region began a new experiment. A good deal of trouble was being experienced in reaching field offices by common carrier, and since a number of the technicians owned personal planes, it was decided to authorize their use for official travel.

The region has 520 work unit headquarters. To reach these small towns by train or bus was a tedious process, usually involving one or more lengthy stop-overs. Fewer than 5 percent of these offices can be reached by air line. Nearly all of them, however, have airports suitable for small planes. Where there is no airport, arrangements can always be made to land on the farm of a nearby district cooperator.

After a year's trial, airplane travel has proved an outstanding success in the Upper Mississippi Region. Staff members leave Milwaukee at their own convenience, fly straight to their destination anywhere in the region, and arrive ready for work. There is no waiting for train schedules and no stop-overs along the route. And costs have been reduced. The writer and technicians traveling with him have saved over \$1,000 in travel expenses during the year by the use of a personal plane, largely by reducing the amount of time spent in travel.

But the original purpose of the experiment has proved to be only one of many advantages. Planes are being used in many ways to speed the work of getting conservation on the land. One of these is measuring the rate of gully erosion. This was formerly largely guesswork, based partly on information provided by the landowner. If the landowner had moved, the main source of information was gone.

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Note.—The author is regional sedimentation specialist, Soil Conservation Service, Milwaukee, Wis.



The author with his four-place plane.

But by using a plane to photograph gullied areas periodically and comparing these photos with the original 1938-40 photographs, made by the Department of Agriculture, the exact rate of gully erosion for various periods can be established. This enables the technician to determine whether the rate of growth is still accelerating, or whether it has reached a peak and is now declining.

The Myers gully, for example, was found to be growing at the rate of 0.5 acre a year from 1938 to 1944. From 1947 to 1948 this rate of growth had increased to 1.45 acres a year, but from 1948 to 1951 it declined to 0.77 acre a year. The gully was thus found to have passed through most of its life cycle, and to be approaching a more stabilized condition.

Another use of the airplane in the Upper Mississippi Region is in measuring rates of stream-bank erosion. Formerly it was necessary, using valley cross sections, to measure the total stream-bank erosion since the area had been cleared, then divide by the approximate number of years during which this erosion had taken place in order to arrive at the annual rate of erosion. This frequently led to serious errors, because the present rate of stream-bank erosion may be greatly different from the average over the past 100 years or so. Using an airplane to photograph bank erosion provides an exact answer as to its present rate. When it became necessary to determine how much of the sediment which is filling Cleveland harbor is derived from sheet erosion and how much from stream banks, gullies, and other sources, aerial photography gave the answer.



Studies in the region show that aerial photography by Government employees costs less than having this work done on contract. The Michigan Conservation Commission, for example, recently paid a private company \$2,500 for 312 aerial photos, or \$8.01 for each photo. The SCS, using a personal four-place plane and K-20 aerial camera, took 450 photos of an adjacent area for \$559, or \$1.22 for each photo. This included all travel expenses for two men from Milwaukee to the area in Michigan and return, and flight over the area plus salaries, film, developing, printing, and overhead.

In the Upper Mississippi Region aerial photos are used extensively as base maps in making reservoir sedimentation surveys. Frequently, however, it is found that a reservoir had not been constructed when the 1938-40 photos were made. In such cases, "vertical" photos of the reservoir can be taken with a light plane and provide an inexpensive method of determining how much a reservoir's surface area has decreased because of progressive filling with sediment.

Numerous other uses have been found for small planes in the region. After last summer's disastrous floods on the Missouri River, the Mackinaw River in Illinois, and other streams, the writer's plane was pressed into service for inspection and photography of the flood-ravaged areas. John S. Glass, regional chief, water conservation division; K. G. Harman, State conservationist from Missouri; and the writer flew over the Missouri River bottoms. The photos obtained formed the basis for much of the emergency flood rehabilitation work now being done by the SCS in this area.

The use of planes for speeding up conservation surveys has been tried in several regions. Preliminary tests made in the Upper Mississippi Region are very promising. In Adair County, Iowa, for example, it was found that production could be increased from 1 square mile a day to 3 square miles a day by supplementing the ground surveys with short aerial observation trips. It was also found that the cost of conservation surveys in this area could be reduced from 2.6 cents an acre to 1.9 cents an acre by the use of a plane, and that the resulting maps are much more accurate. It is planned to intensify greatly the use of planes for conservation surveys in the near future.

Other uses for personal planes in speeding the application of soil conservation measures will undoubtedly be found. Upper Mississippi Region's experiment in more convenient and faster transportation has developed a tool for use in many phases of soil conservation. In addition, all of the SCS technicians who have taken part in this development have the inestimable advantage of really *knowing* the region, of being familiar with each erosion problem area, and of being able to follow progress in conservation in an intimate way.

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### CASCADE LOTUS

(Continued from page 281)

members of the Washington State Crop Improvement Association. Limited amounts of both registered and certified became available for the first time in the spring of 1952.

Although Cascade Lotus yields more than other strains of Lotus, it will not yield as much as alfalfa on deep, fertile, well-drained soils. Nor will it yield with Ladino on the better irrigated soils of the coastal area. But where these stand-by legumes cannot make the grade, Cascade Lotus looks like a highly practical and profitable substitute.

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### STORAGE PONDS

(Continued from page 277)

if his large dam had been built in 1937—the year the district irrigation ditch broke—it would have paid for itself the same year. His three reservoirs catch all irrigation runoff in his orchard. Water is then pumped back into the pipe lines for sprinkler and furrow irrigation. Thus, his water is used over and over. Next winter his ponds will be refilled with a fresh supply of runoff water from the uplands. Veerkamp doesn't know how many times he will use this water, but none will be wasted.

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### SEED PRODUCTION

(Continued from page 266)

State Plant Board, the State inspector of apiaries, and representatives of industrial firms concerned with phases of seed production.

The meetings were sponsored and arranged by the supervisors of the Washington County, Benton County, Madison County, and King's River-Long Creek Soil Conservation Districts.

—J. E. CRITZ

# KENTUCKY FARMERS REDISCOVER SERICEA

By WALTER J. GUERNSEY

**S**ERICEA LESPEDEZA is staging a come-back in Kentucky. It was planted in many places about 20 years ago, but most of the plantings were soon destroyed. We know now that they were not given the proper care.

When left to grow, it thrives and does well. Grigg Simms in Washington County, Ky., planted an old, gullied field to sericea in 1931 for erosion control and for seed. This field was literally "forgotten" for 17 years. The gullies were healed, the soil was held in place, and the fertility was greatly increased. It was cut for hay in 1948.

The come-back of sericea in Kentucky started on a small scale soon after soil conservation districts were organized. From 1941 through 1945, only 728 acres were planted by cooperating farmers. This increased to 5,378 acres in 1951.

Farmers now using sericea are enthusiastic about this five-way crop. It provides hay, pasture, and seed; improves soil fertility; and prevents soil erosion.

"I am mainly interested in getting something to grow on my hills that can be used for pasture and will not let the land wash away. Long-life stuff is better for the man and his country, too," said Tip Hurst, of Cannon, Ky., a cooperator with the Richland Creek Soil Conservation District. Tip was talking about his sericea-covered hill land.

Usually, sericea makes little top growth the first year. This is considered a bad feature by some, but Chester Root of Clay County, Ky., said, "I actually believe I got more off sericea the first year than Korean would have made, and on thin places it made real growth."

V. L. Cantrell, of Green County, Ky., made this observation about sericea hay. "Six head of cattle have been fed through the winter on hay produced from 2 acres of wasteland. My



Harvesting sericea for hay.

cattle preferred sericea to redtop, orchard-grass, and Korean hay from good land, so I sold it and kept my sericea at home."

James W. Hayden, Mayfield, Ky., a tenant on the C. A. Byrn farm, harvested 594 bales of first-class hay from 4 acres. This was an average of 5 tons per acre. He made two cuttings and pastured the field for 2 months after the last cutting. Hayden won the grand champion prize on his sericea hay at the Jackson Purchase Fair in August 1951. His cattle liked the sericea hay. His cows doubled production within 3 days after changing from Korean and grass hay to sericea hay.

Sericea hay is of better quality if mowed when it is young and tender—10 to 14 inches high—and it should be raked soon after cutting.

Tip Smith, a Goose Rock, Ky., farmer and veteran agricultural teacher has 25 acres of sericea on his own farm. He says, "I tell the men in my class that if they have only 2 acres of land they ought to put 1 of the 2 acres in sericea."

Harvesting of sericea seed may eventually develop into a cash crop for farmers.

Leonard Grief, Paducah, Ky., thinks he would have made more money by harvesting

Note.—The author is nursery manager, Soil Conservation Service, Paducah, Ky.



all his sericea seed and letting his soybeans shatter in the field. He harvested about half the sericea seed on 16 acres.

Fred Travis, of Crittenden County, harvested 465 pounds of clean seed from 1 acre. He is planting more acres this year.

Sericea has a vigorous root system that penetrates deep into the soil. It also lays down a dense leaf litter. Stems, roots, and leaves help hold the soil, especially on steep hills.

Although the spread of sericea has not been so spectacular as that of Kentucky 31 fescue, it is beginning to fill the need for a long-lived perennial legume on land too steep for cultivation. Many farmers are finding sericea and fescue grow well in combination. Thomas B. Shackelford, cooperator with the Lee County Soil Conservation District in Kentucky says, "Sericea and fescue are the salvation of our mountain counties. I am seeding all my pastures to this combination."

At the SCS nursery, Paducah, Ky., a 5-acre field of sericea 5 years old was plowed under and planted to Kentucky 31 fescue during the fall of 1947. With no fertilizer this field produced 650 pounds of seed per acre the following spring. The good effects of the sericea were still noticeable on the fescue after 4 years.

A. B. Ray, Graves County, increased his corn yield from 12 to 80 bushels per acre by growing sericea the 4 years previous. This was on Class IV land, generally considered too steep for safe cultivation.

Stock graze sericea most readily when it is young and succulent. It should be mowed, if necessary, to provide tender new growth.

Many farmers have found that it is convenient to have a field of sericea to turn cattle into when other pasture dries up.

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**IDAHO PROGENY.**—More and more, the soil conservation districts are putting type to work. Latest, and one of the best, of the State periodicals is *Conservation Farming in Idaho*, which made its bow in February. This is a newsy 12-page, 3-column quarterly, illustrated by halftones and supported substantially by advertising. It is the official spokesman of the Idaho Association of Soil Conservation Districts.

The first two copies off the press were presented to Waters S. Davis, Jr., president of the National Association of Soil Conservation Districts, and Dr. Robert M. Salter, Chief of the Soil Conservation Service.

This publication is the result of several years of effort on behalf of the State association. The managing editor is Don E. Lloyd of Lewiston. Other members of the business staff include Marion Holben of Genesee, business manager; Don Benedict, Culdesac, circulation manager; Harold Snow, Moscow, advertising manager; Roy Emerson, Genesee, treasurer; Louise Lloyd, Lewiston, associate and art editor.

It is most interesting to note that all of the foregoing persons are past supervisors who have served as soil conservation district supervisors of their respective districts for one or more terms.



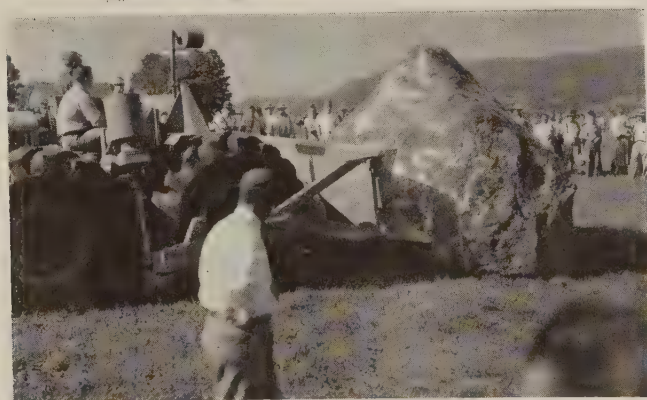
Beef cattle and sericea, a fine combination.





Harold Whittier, left, receives trophy on behalf of district from Charles Kendall of the sponsoring bank. Ralph Easterbrook, right, is district chairman.

**CONTINUED ACHIEVEMENT.**—An interesting new idea in the recognition of achievement in conservation farming is found in Massachusetts where the emphasis has been shifted from "achievement in 1 year" to "continued achievement." This new slant had its debut in Worcester County, where the First National Bank of Webster has donated a trophy to the Southern Worcester County Soil Conservation District, which will present it annually to a farmer "in recognition of continued achievement in conservation of soil and water." The 1952 winner is Felix P. Default of Spencer. The shift in emphasis should encourage establishment of complete conservation plans, according to conservation leaders who have observed too often that winners of awards for a year's achievement have failed to carry through in succeeding years. In several large conservation-farming contests in New England a like shift in award emphasis is being considered.



Rock being escorted from field by bulldozer.

**ROCKS SAVE SOIL.**—When a face lifting was held in 1949 at the Hadala farm, Adams, Mass., many large rocks—some weighing 20 tons or more—were lifted out of the fields and rolled into gullies and other waste

spots. Many wondered if any good use could ever be made of them. Now they've become soil savers. Prized by Army Engineers because of size and weight, the rocks have been trucked to a flood-control project in the Hoosic River near North Adams and put to work as riprap to protect the stream bed and banks, and hold the river in its channel. With the stilling basin and silt traps, flood crest will be lowered, and with the stream channel protected, damage will be reduced.

**ROTARIANS HOSTS.**—For their March 1952 meeting, the Rotarians of Black River Falls, Wis., were hosts at a banquet for 61 Jackson County Soil Conservation District farmers who had been judged outstanding in the 1951 grassland-farming contest sponsored by the Wisconsin College of Agriculture. In looking over the guest list, Joseph D. Zellinger, SCS work unit conservationist, found that all 61 were cooperators with the Jackson County Soil Conservation District, with farm plans prepared with the assistance of the Soil Conservation Service.



The Bender family.

**CONSERVATION PROGRAM FOR ISRAEL.**—William H. Bender, who for 6 years has conducted the training school for the Upper Mississippi Region at Coshocton, Ohio, has been granted a 1-year leave of absence to assist the new State of Israel in setting up a soil and water conservation program. After a short briefing period with the Food and Agriculture Organization of the United Nations in Washington and Rome, he will be stationed at Nathanyia on the Mediterranean, 20 miles north of Tel Aviv. Most of his time will be devoted to the training of 150 soil conservationists who will become the field staff of the Israel Soil Conservation Service.

Bender's training work has attracted world-wide attention. In 1949 the training school at Coshocton was the subject of a Voice of America broadcast. Agricultural publications in many countries have printed stories about his work at the school; and he was given an award for superior accomplishment by the Service in 1949.

Mrs. Bender and their two daughters, Deena and Sandra, will accompany him on his assignment. Although English is well understood in Israel, there are no English-sponsored schools. The whole family expects to learn Hebrew.













